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THE MONTH

SUPERFICIALLY there might appear to be little need at the present day for a symposium on 'Infective Diseases'. In his opening gambit, however, in the introductory article on 'The infective diseases in general practice', Dr. Geoffrey Barber gives one very good reason for publishing such a symposium. He tells the story of 'a railway carriage being sealed and disinfected in recent years because the guard found a child with chickenpox travelling in it'. Equally relevant is his comment that 'the quarantine regulations which still are observed in some private schools have remained unchanged since they were formulated nearly a hundred years ago'. In his final sentence he gives a second equally sound reason for such a symposium: 'We must therefore be on our guard and always prepared for an infective disease to spring a surprise'. Of the seven diseases dealt with, three have been deprived of many of their old terrors as a result of immunization, but the periodic appearance of cases of smallpox and diphtheria is a warning against lack of vigilance. Indeed, one of the main duties of the family doctor today is to do all he can to ensure that *all* the children committed to his professional care are fully protected against diphtheria, smallpox and whooping-cough. If the preliminary results reported from the United States are confirmed, it may well not be long before measles, the other main hazard of childhood, is also brought under control.

The Symposium

IN 1945, Mr. Aneurin Bevan informed the Labour Party Conference that 'if we were rich enough we would not want to have free medical services, we would pay the doctor'. It is with this entertaining commentary on the socialist philosophy of life that Professor and Mrs. Jewkes preface their provocative pamphlet, 'The Genesis of the British National Health Service' (John and Sylvia Jewkes. Published by Basil Blackwell, price 6*s.* 6*d.*). It is described as the first of 'what it is hoped will be a string of essays on the economic and administrative aspects of medical systems'. Professor Jewkes, of course, is probably best known to the medical profession as the author of the long 'Memorandum of Dissent' incorporated in the Report of the Royal Commission on Doctors' and Dentists' Remuneration. Such is the fate of a modern economist who dares to become embroiled in medical politics!

Genesis of N.H.S.

It is an irritating as well as a stimulating pamphlet. Irritating in so far as the authors have considered it necessary to demolish Aunt Sallies which

have only existed as figments of imagination on the part of politicians. This, of course, is no criticism of the authors. It is not their fault that there should be widespread stories about the National Health Service being a panacea, and that our pre-1948 medical services were deplorable. Needless to say the Jewkes' disthronement of their Aunt Sallies is effective. The tragedy is that it was ever necessary to disthrone them. It cannot be too often repeated that the National Health Service has succeeded in spite of the politician. We had nothing to be ashamed of in our pre-1948 medical services. Taken all in all they probably constituted the best medical service in the world. Of course, there were defects, but these were gradually being remedied and, if the politicians—of all parties—had not crashed in and used blunderbuss methods when the gentle technique of the British school of surgery was required, the country would have had a much better National Health Service today than we actually possess.

Continental Typhoid

In 1959, the deputy director of the French Government Tourist Office challenged a statement of Dr. A. H. Douthwaite that holidaymakers in France should be inoculated against typhoid fever (*The Practitioner*, 1959, **183**, 362). In his reply, Dr. Douthwaite reiterated his original statement, saying: 'The fact is that since the last war I have seen five cases of typhoid or paratyphoid acquired in that country. The figure is not negligible when one considers that I am merely one physician among many'. In the intervening two years there has been increasing evidence of the validity of Dr. Douthwaite's recommendation.

In 1959, for instance, according to the annual report of the chief medical officer to the Ministry of Health (the latest to be published), there were 123 cases of typhoid fever in England and Wales, and 'no less than one-third of the patients were infected abroad. In particular, two coach tours on the Continent in July and August resulted in 13 cases widely scattered in England and Wales'. In 1960, the medical officer of health for Edinburgh reports, there was one case of typhoid fever in the city. 'The patient was a girl of 11 years of age who had been on a caravanning holiday in France and became ill on her return to school in Edinburgh. She had not received T.A.B. vaccination before going abroad'. The evidence from France itself indicates the need for preventive action on the part of intending visitors. In Paris alone there were 320 cases of typhoid in the first half of 1960, and Maurice Kaplan and Roland Bernheim (*Sem. Hôp. (Paris)*, 1961, **37**, 2035) have recently published a study of 50 cases of typhoid and paratyphoid fever seen in the children's department of the Hôpital Bretonneau in Paris between January 1957 and June 1960. They conclude their report with a plea for the inoculation of all children with T.A.B. vaccine. In view of these facts it would appear to be merely common sense to recommend all visitors to the Continent, with the possible exception of Scandinavia, Switzerland, and The Netherlands, to be inoculated against typhoid and

paratyphoid fever unless they have been so inoculated within the preceding five years.

Meat Pies

If there is one section of modern life in which words seem to have lost their old connotation it is the catering and food industry. What, for instance, do we mean by a 'meat pie'? This is the difficult question that the Edinburgh city analyst, Dr. A. Scott-Dodd, attempts to answer in the annual report of the city's medical officer of health for 1960. His facts are based upon an analysis of 25 pies purchased during the first six months of the year. The two important findings were that the meat content of the pies ranged from 8.7 to 38.3 per cent., and that the amount of filler per pie varied from 1.3 to 31.2 per cent. The other variable finding was the kind of meat in the pie. This might be minced meat, sausage meat, 'scraps of any kind of meat', or cooked meat.

In view of these findings it is scarcely surprising that he feels compelled to utter the truism that 'pies show some very marked differences in composition'. The consumer will, perhaps, agree even more wholeheartedly with his statement that 'the selection of a satisfactory pie by chemical analysis is one of extreme difficulty'. In spite of all the difficulties, and with a courage that one cannot but admire, Dr. Scott-Dodd is brave enough to provide a definition of 'a satisfactory pie' as one which gives: (i) a satisfactory weight of meat in the small pies (150 g. or less); (ii) meat which is neither too fat nor too lean and of good and tender quality; (iii) a short and palatable pastry rather than a hard, tough and unappetizing one'. The analytical basis of such a pie, he suggests, is one which contains at least 15 per cent. of meat and which does not contain more than 25 per cent. of fat. If he could go a stage further and decree how such a pie could be universally obtainable his name would go down to history as one of the minor benefactors of mankind. Will a 'Scott-Dodd' become a synonym for a meat pie really worth eating?

Leisure in Outer Space

There are times when the cynic in each one of us must wonder what would be the lot of mankind on earth if one iota of the time, money and energy spent on exploring outer space were spent on more terrestrial projects. Be that as it may, space travel has seized the imagination of the scientists almost as obsessively as it has that of the vacillating politician. If man is to be shot off into outer space, one of the questions that will inevitably arise is: Can facilities be provided which would enable a space crewman to spend his off-duty hours on a space mission in a way similar to his everyday life on earth? According to E. E. Eddowes, of the 'Human Factors Laboratory, Air Arm Division, Westinghouse Electric Corporation, Baltimore' (*Aerospace Med.*, 1961, **32**, 541), the answer is in the affirmative, with the aid of 'proper "human engineering" of the space vehicle'.

The assumption upon which this affirmative is based is that man 'could live and work effectively in the artificial environment of a space vehicle if

he were given work appropriate to his ability and education, were given adequate opportunity for rest, and were permitted to engage in the same leisure time activities that he engaged in on earth'. Eddowes therefore investigated the spare-time activities of eighty of the Corporation's personnel with 'similar characteristics to the population from which space crewmen will be selected some day'. This showed that nearly all the individuals investigated engaged in sedentary activities and that reading, watching TV, musical, manual or handicraft, educational, miscellaneous work and social activities accounted for all the different types of activities reported by more than ten per cent. of those investigated. All these could be catered for in a space vehicle. A micro-film library would provide reading matter, whilst tape record libraries 'perhaps supplemented by a communications system from an earth base could serve to supply the crew with TV-type entertainment and music as well as news from home'. In addition, there could be materials for the crew to 'engage in leisure time handicraft and manual activities'. Whatever may be the precise practical value of these suggestions the space-traveller of the future has at least the assurance that his creature comforts are not being forgotten.

A Passing Pharmacy

One of the latest victims of the current craze for rebuilding London is a pharmacy in Golders Green. Although only opened fifty years ago, a short account of the pharmacy by the founder's daughter (*Chem. and Drugg.*, 1961, **175**, 632) provides a striking example of the change which has come over pharmacy and medicine in such a relatively short period of time. Indeed, even the changes in the thirty years that have elapsed since the daughter started to work in the pharmacy will seem almost unbelievable to the medical and pharmaceutical student of today.

Going back to her childhood days she recalls how doctors arrived at the pharmacy in a carriage and pair, wearing silk hats and morning coats, to be received at the door of the pharmacy by her father also in formal dress (black coat and trousers) and business was subsequently conducted with 'a dignity befitting both professions'. The process of 'cleaning out' brought to light an 'impressive eight-pint earthenware infusion pot' which at one time had been used daily for the production of fresh gentian infusion. On the shelves were jars and pots labelled: 'Chelsea Pensioner', 'Ung. Calefaciens', 'Inf. Chiratæ Co.', and 'Erasmus Wilson's Green Ointment'. A somewhat different, though equally nostalgic, note is struck by some of the names found in the 131 prescription books (containing over half a million prescriptions). These include such well-known theatrical names as Marie Lloyd, Lily Morris, and Anna Pavlova. The reason for this unusual representation of actresses (and actors) is that the pharmacy was just across the road from the Golders Green Hippodrome. Unfortunately, no details are given of the constituents of the prescriptions presented by these stars of another age.

THE INFECTIVE DISEASES IN GENERAL PRACTICE

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The symposium in this month's issue of *The Practitioner* is concerned with a group of common infections which most children in this country are likely to contract before adult life. They all tend to confer immunity against a second attack, and at present three of them can be guarded against to some extent by immunization. The general practitioner is intimately concerned with their diagnosis, their spread, their treatment, or their prevention, and in few other fields of medicine, saving perhaps psychiatry, is there such a divergence of opinion and practice among the profession and the public alike. This is because the infective diseases have been the subject of legislation: whereas scientific thought is always being modified by better understanding, laws and regulations once established are hard to vary.

I have heard of a railway carriage being sealed and disinfected in recent years because the guard found a child with chickenpox travelling in it; and the quarantine regulations which still are observed in some private schools have remained unchanged since they were formulated nearly a hundred years ago in a most necessary campaign to reduce the death and permanent disability which some of these diseases used to cause in those days.

A CHANGED PICTURE

The really striking thing about the infective diseases is the vast change in their severity, even during the thirty years of which I have experience in a country practice. Every doctor sees a different picture depending on the way he looks at it, and on the variation in his neighbourhood of morbidity due to density of population, industry, poverty, climate and so on.

During the early 'thirties, farming was in a poor way and most of my patients were labourers. If they were in work they earned only twenty-eight shillings a week. Very few cottages had water drains or electricity, and many children were undernourished and poorly clothed. I inherited half-a-dozen patients with advanced pulmonary tuberculosis, slowly coughing their lives away; every sore throat was a potential diphtheria; children died of whooping-cough, scarlet fever, bronchitis and pneumonia, and in 1938 there was a big epidemic of poliomyelitis.

This is a very different picture from that of today when living conditions are as a whole so greatly improved, but against this must be set the much greater risk of infection at a much earlier age, for very few babies can be born into isolated surroundings nowadays. Communication is so easy and rapid and our way of life tends to congregate us together so much in everyday life that even the most obsessional mother can no longer protect her child from chance contact. This is one reason why we should all give roughly the same answer when questioned by parents about quarantine, isolation and immunization, about immunity conferred by one attack, and above all that we should be able to diagnose infective rashes with some certainty.

In subsequent articles in this symposium each disease will be discussed

by itself in detail by authorities on infective diseases, but they do not usually see the very early stages nor do they have to deal with management in the home and advice to contacts, so that I shall concentrate on these two points so far as my experience allows.

DIAGNOSIS

Each disease will in due course produce the characteristic rash or other physical sign at the climax of the conflict, but it is the prodromal stage of invasion which can be so confusing, and only experience coupled with meticulous observation can 'spot the winner'.

I remember a boy of ten with bronchitis. It was before the days of antibiotics, and the usual symptomatic treatment had no effect. The local pædiatrician was called in, and after his second visit he admitted him to a children's ward where after another week he developed a beautiful measles rash!

On the other hand rubella can give scarcely any warning at all, as in another case.

Here a bride blamed her feeling of malaise on natural apprehension, but when she drew aside her veil in the vestry—there was german measles in full bloom.

It is a safe rule to consider the prodromal stage of an infective disease as a possibility in any case of fever and malaise in a child or young adult. At any rate it is wise to ask if there is any known contact and also what the patient has already had: for with the exception of scarlet fever I believe that second attacks are rare and are sometimes explained by a mistaken diagnosis or the faulty memory of a parent. Since the start of the National Health Service a personal record follows a child from place to place, so we shall soon have factual evidence on which to judge the genuine frequency of second attacks.

RASHES

After the prodromal stage comes the first presenting physical sign: a rash, a sore throat, or a swelling—sometimes two of these, or even all three. Take the rashes first. One of the best places to learn these is a residential school or institution, where the matron will want a doctor's opinion at the earliest onset, and where one has had an opportunity of seeing a sufficient number of cases during an epidemic to get an idea of the variation of the same infection in different cases, and where with any luck one can sometimes have the fun of two or three epidemics running at the same time. The south of England has been giving us a lovely exercise with measles, rubella, scarlet fever, chickenpox and mumps all nicely together.

The differential diagnosis between *chickenpox* and *smallpox* will be dealt with in detail elsewhere; here it suffices to say that the *possibility* of smallpox must always be borne in mind. Insect bites can sometimes mimic chickenpox, but their distribution gives them away.

Taken as a rash alone, *measles* is the most patchy, scarlet fever the most even, with rubella somewhere in between. Measles takes a good deal longer to develop than the other two, but it is the associated symptoms and signs on which the early diagnosis rests. The measles patient is nearly always *ill*,

with a prodromal period of several days and getting progressively worse while the rash is developing. If one adds a spasmodic cough due to the mucosal rash of the air passages, with the actual observation of this rash on the soft palate and buccal membranes and the conjunctivitis with associated photophobia, the picture is classical. Koplik's spots are by no means to be relied upon: I place more confidence on a patchy rash on the soft palate, though I have seen this in what turned out to be acute tonsillitis.

Rubella or german measles presents exactly the opposite picture, for the prodromal stage is usually short and mild. It ought to be fairly easy to sort it out from ordinary measles, but it is with other more common rashes that it can be so easily confused. How often is one told by a mother: 'It's that german measles again doctor that she's always getting'. Toxic or allergic rashes can be indistinguishable from it, and so can the rashes associated with virus diseases of the ECHO and Coxsackie types. In the old days these were lumped together as 'fourth disease'. For the diagnosis of rubella one has to take into account the presence of other cases in the neighbourhood, any allergic history of the patient and the family, and any circumstantial help from a recent wedding breakfast or other opportunity to eat unusual food. In rubella shotty glands in the neck can be a help, but they are unreliable because they are quite often felt in allergic rashes, and may not be easy to feel in rubella if there is much subcutaneous fat. Yet a firm diagnosis is called for, because of the danger to the fœtus in early pregnancy.

The other infective rash is *scarlet fever*, which should be easier to distinguish from its very fine and even distribution and its usual association with the tonsillitis which is its cause. It is only since the work of Griffiths and others in the 1930's that the rash has been considered less important than the underlying hæmolytic streptococcal infection of the throat. By its very nature the hæmolytic streptococcus can cause serious toxic damage to the heart muscle and to the kidneys, and it can spread to the middle ear and mastoid cells, and it *sometimes* causes a toxic rash which we call scarlet fever. So that it is the streptococcal tonsillitis that matters, and the rash in one case is only the red flag which is a warning of a much more widespread infection where no rash will occur but all the other toxic effects are just as likely. This is where legislation for public health lagged behind medical knowledge, and it used to be very irritating to have to send only the child with the scarlet fever rash off to an isolation hospital when the brothers and sisters with nephritis and myocarditis and otitis media had to be cared for as best one could in their primitive cottages.

In those days of local dairies and milk in a jug straight from the tap in the churn at the back of the milk cart, milk was undoubtedly responsible for a good deal of the spread. My own children had their milk 'brought to the boil' and it was quite usual practice for mothers and nannies to take their own milk in a bottle out to parties.

SORE THROATS

But if it is the hæmolytic streptococcal tonsillitis that is potentially dangerous even in these days of effective antibiotics, how can one recognize it

when it is *not* accompanied by the scarlet fever rash? This can only be done with certainty by a swab being examined in the laboratory, and general practitioners have to make their own decision as to whether to start sulphonamides or penicillin or tetracyclines before knowing the result. The decision depends upon clinical assessment of both the infection and the type of patient. A child who has had previous otitis media or nephritis or heart disease deserves an antibiotic shield at once, and it is reasonable to give this for contact only, especially if the case is in the same household. The infection often produces a purulent exudate from the tonsillar crypts which may coalesce into a membrane, and it is here that diphtheria must always be considered even though mass immunization has made it rarer.

Fortunately the days are past when every sore throat was a possible diphtheria and early diagnosis by a swab could be a matter of life and death.

An old farm labourer once told me that forty years ago he took his wife and three children in to Chelmsford for a day's shopping ending with a visit to the fair. A fortnight later only one child was left alive, and my cousin and my brother died of it at about the same time.

As a young house surgeon in a children's hospital in Paddington, I had to do half-a-dozen tracheotomies on children who were admitted *in extremis*.

In spite of immunization programmes cases do still occur, and it is no bad thing to ask the parent of a child with a sore throat if the child has been immunized. If the answer is 'no' it puts one on guard, and may also bring home to the parents the very real danger they can take steps to avoid. A membrane on only one tonsil or in one nostril, dirtier than the purer white of the streptococcus, adherent when swabbed, all these are classical signs which should be heeded even though they are not infallible.

These infections of the throat often cause swelling of the tonsillar cervical glands in the angle of the jaw: sometimes the cervical adenitis occurs with little obvious tonsillitis, and the doctor will be asked to see a suspected case of mumps. Before the compulsory pasteurization of milk, bovine tuberculosis was all too often the cause of these large swollen glands, especially with swelling on one side only. Mumps is quite easy to differentiate when the parotid is swollen and one remembers one's anatomy, and difficulty arises only when it is the submaxillary gland which is affected. Careful examination of the throat, the duct openings and the parotid, cervical, and submaxillary glands should give a plain answer.

COUGHS

Finally whooping-cough. This is one of the most difficult of all to diagnose in its early stages especially nowadays with attenuated attacks due to immunization. I believe that the Chinese call it the 'hundred days' cough', and it is true to say that a persistent paroxysmal cough that produces no physical signs and appears to defy all treatment can reasonably be called whooping-cough. I have found nothing out of the hundreds of so-called remedies which does more than give relief in some cases. Often an apparent success is due merely to the natural remission of the disease. Diagnosis is chiefly a matter of excluding a subacute asthma, but in an asthmatic child

whooping-cough will bring on attacks, so that laboratory help is often the only solution.

TREATMENT

After diagnosis comes treatment, the aim of which is to relieve the symptoms and to guard against complications. This means that in the home we have to spend some time in telling the mother the important points. There has been a great change in our attitude from that of thirty years ago. As students we were impressed by the necessity for rest and immobility, which led to an over-rigid regime and kept a lively convalescent child in bed until twenty-four hours after the temperature had returned to normal or below. In measles, however, this may take several days, and housewives nowadays have more essential duties than keeping convalescent children amused while they have to stay in bed: so that there are bumps on the ceiling and a general consensus of opinion that the doctor is an old fusspot. If a child is going to be out of bed anyway at this stage, it is better to be so officially —under mother's eye and on a sofa downstairs, where for once the television can be a real boon. On the whole a child can set his or her own pattern in illness with regard to bed and food, and I hope the days are gone when the rules are more important than the patient. The one important exception is mumps in boys past puberty. The risk of serious orchitis must limit activity for at least ten days and the boy be asked to report any early discomfort. It is worth taking a little trouble over how this is done, for boys at this age have vivid imaginations and can easily be alarmed unnecessarily.

Mothers often need reassurance that a child needn't 'eat to keep up his strength', and that ice-cream and especially iced-lollies on sticks are a pleasant and harmless invalid diet. A lot of money is spent on simple but highly advertised effervescent glucose mixtures which a child regards as a treat, whilst the high price satisfies the parent. So that general advice to the parent can be summed up as bed until the child wants to get up, and then gradually and under supervision, plenty to drink, fewer bedclothes when they are feverish, fresh air in moderation, and any reasonable food but only when they ask for it. The bowels should be watched but the old routine purge of my youth no longer adds insult to injury. In chickenpox I have two useful tips: cold calamine lotion can sting, so warm it slightly; and keep the child's nails short and scrupulously clean.

Drugs.—In scarlet fever the appropriate antibiotic must be given, but in the virus diseases no drugs are yet recognized to have any effect on the virus itself. Specific therapy is therefore aimed solely at the prevention of complications and when it is given it must be in adequate doses. We must be willing to relieve symptoms, such as the cough and conjunctivitis in measles, the pain in mumps, and to give a sedative so that the patient can sleep through the worst of the prodromal restlessness.

NOTIFICATION AND CONTACTS

Notification.—The regulations require this for cases of diphtheria, smallpox,

measles, whooping-cough and scarlet fever, as well as other diseases not considered here. I find whooping-cough is often difficult to decide upon.

Contacts.—It is in dealing with contacts that we need to be clear and united in our policy over isolation, quarantine and school exclusion. The key to the question is whether immunity has been acquired—either by immunization or by an attack of the disease—for in either case no action is needed and any regulation that insists on it can only be justified by unusual circumstances. It is therefore our direct responsibility as general practitioners to see that the babies born into our practices are immunized against diphtheria, whooping-cough (and tetanus) and against smallpox. Many of us prefer to undertake this ourselves as it gives an opportunity of keeping an eye on the child's first few months of life.

When immunity can only be acquired by an attack our aim is twofold. For the individual patient we want the child to have an uncomplicated attack in youth under the most favourable circumstances and supervision. It is especially desirable that boys should escape the risk of orchitis by having mumps before puberty, and that girls should have rubella so as to avoid the anxiety of a possible attack later on during pregnancy.

The importance of this was brought home to me by a young man who had been very carefully protected by the old rules of quarantine and isolation. In one year his own children gave him whooping-cough, mumps with orchitis, and chickenpox. All were severe and he not only lost a good job but it took him a long time to get really strong again.

In the community we want to reduce the nuisance value of an epidemic especially in schools. We owe a great debt to R. E. Smith's revolutionary step in abolishing quarantine for these minor infective diseases at Rugby School in 1932, which resulted in the saving of such an immense number of good working school hours in healthy boys, and pioneered our modern attitude. This, of course, is the standard policy now with the Ministry of Education which requires no exclusion of contacts of rubella, whooping-cough, mumps and chickenpox, or measles when the contact has already had it. Any private school or institution that does not conform to these simple rules can only be doing so from out-of-date tradition, a tradition which is now obsolete, or from a mistaken effort to avoid the immediate nuisance or even to give parents an impression of the extra care they give their pupils!

CAVEAT

Finally a word of warning, for we all learn more from our mistakes. However straightforward a case may appear there is just that one case in a thousand that can go wrong.

I can remember a death from post-measles encephalitis four days after the rash had faded. And a healthy boy had a simple attack of rubella but ten days later he developed such a widespread peripheral neuritis that he had to be in an iron lung for some days. In that particular epidemic of eleven cases, two others had minor pareses: all recovered completely as they nearly always do.

We must therefore be on our guard and always prepared for an infective disease to spring a surprise.

DIPHTHERIA

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Diphtheria is an acute infectious disease caused by the *Corynebacterium diphtheriæ* (Klebs-Loeffler bacillus) and associated with the formation of a 'false membrane' and the production of a potent soluble exotoxin.

ETIOLOGY

Whilst the disease occurs at all ages it is commonest in childhood. It is rare under six months of age on account of a transmitted immunity. Droplet infection by the human carrier is the most important cause of spread of the disease. Articles which have been contaminated with discharge from the nose or mouth may spread infection but are generally unimportant in the transmission of the disease. Food and drink do not ordinarily convey infection although milk infected from a human source may do so.

The introduction of the national immunization campaign in 1940 has resulted in a striking fall in notifications and deaths from diphtheria. Outbreaks in various parts of England during the past year, however, indicate the need to maintain the highest possible level of immunity against diphtheria in the population. At least 75 per cent. of pre-school children should be actively immunized if the disease is to be kept under control. Because of parental apathy in many areas, the number of children protected by immunization today is insufficient to ensure freedom from infection should a severe form of the disease appear. The individual practitioner, who is constantly consulted about the safety and efficacy of active immunization, can take a leading part in educating the public in this matter.

BACTERIOLOGY AND PATHOLOGY

There are three main types of *Corynebacterium diphtheriæ*—mitis, intermedius and gravis. Mitis produces mild or moderate diphtheria; intermedius and gravis are responsible for severe and toxic forms of the disease. These types can be distinguished by the distinct colony formation on blood agar tellurite medium and by their ability to ferment starch.

The typical lesion of the disease which enables it to be recognized is the formation of a false membrane at the site of infection. The membrane consists of fibrin, necrotic epithelial cells and bacteria. The exotoxin produced damages the epithelial cells causing necrosis; and fibrin is produced from the clotting of the plasma from the underlying vessels. The absorption of exotoxin causes similar inflammatory changes in the regional lymphatic glands; and dissemination by the blood stream affects almost all tissues, with a special affinity for the myocardium, adrenal cortex, renal tubular

epithelium, liver and peripheral nerves. The principal varieties are faucial, nasal and laryngeal. Each type may occur independently or in combination with another or with rarer varieties of the disease.

SYMPTOMS AND SIGNS

Faucial diphtheria.—After an incubation period of two to four days, the disease begins insidiously with symptoms of general malaise, anorexia, headache and slight pain in the throat. In children there is often no pain in the throat until the disease is well advanced. The temperature is normal or slightly raised and gives no indication of the severity or progress of an uncomplicated case. Examination of the throat reveals uniform greyish or yellowish white membrane covering one or both tonsils adherent to the subjacent mucosa. The membrane tends to spread to adjacent tissues—faucial pillars, uvula, soft palate and pharyngeal wall—if not recognized as diphtheritic in nature. Apart from a small margin of congestion surrounding the membrane there is no inflammation of the mucosa.

In moderately severe cases membrane is usually present on both tonsils and uvula, the tonsillar glands are enlarged and there is often a discharge from the nose. In severe or toxic infections the appearance is of an ill toxic patient with pallor, loss of tone in the facial muscles and tachycardia. Membrane, which varies in colour from white or cream to grey or black from hæmorrhage below the exudate, is present as one continuous extensive sheet covering the tonsils, uvula, much of the palate and sometimes the pharyngeal wall. Faucial œdema is marked and there is gross cervical adenitis and periadenitis giving rise to the so-called 'bull-neck' or 'proconsular neck'. The palatal œdema or the gross cervical periadenitis has sometimes caused toxic diphtheria to be misdiagnosed as quinsy or mumps—with tragic results.

Hypertoxic or hæmorrhagic diphtheria.—In addition to these signs of toxicity there is an irregularly distributed petechial or purpuric rash. Toxæmia is intense and hæmorrhage from the nose, throat and bowel may occur.

Nasal diphtheria.—In many cases there are no symptoms beyond a mucopurulent or blood-stained nasal discharge. Excoriation of the nostrils and upper lip is common and membrane may be seen lining the anterior nares. Purely nasal diphtheria is generally mild but may give rise to severe toxæmia, especially in association with severe faucial diphtheria.

Laryngeal diphtheria.—This may be primary, with no signs of infection in the throat or nose; or it may occur as a direct extension from the pharynx. The condition is commonest in young patients, and the first symptoms are hoarseness, loss of voice and a croupy cough. After the initial stage which may last only for a few hours, the patient enters the spasmodic stage and suffers from recurrent attacks of dyspnœa and restlessness. The breathing becomes laboured, noisy and stridorous. Respiratory obstruction due to membrane and/or œdema and spasm gives rise to recession of the soft parts

of the chest wall and the epigastrium during inspiration. The intervals between paroxysms of coughing become shorter and restlessness becomes marked as dyspnœa increases. The third and final stage is that of permanent obstruction. Cyanosis and dyspnœa are constant. As the heart fails the face becomes pale with purple lips and the patient too weak to struggle. If the obstruction is not relieved, death by asphyxia is the natural sequel.

Tracheo-bronchial diphtheria.—In this rare but very dangerous variety, membrane forms either in the small bronchi and extends up into the trachea or it may appear first on the fauces and spread down into the bronchi. Severe toxæmia with marked dyspnœa, lividity, and diminution or absence of breath sounds indicative of extensive emphysema are the characteristic features.

Cutaneous diphtheria.—During both World Wars diphtheria of the skin occurred among troops in tropical and subtropical areas, from secondary infection of desert or jungle sores by *C. diphtheriæ*. Many cases were not recognized until signs of myocarditis or peripheral neuritis occurred.

Conjunctival diphtheria.—In this variety a thin whitish membrane is present on the conjunctiva. Infection of the cornea may ensue leading to opacity and loss of vision. Still rarer forms of diphtheria may involve the middle ear, genitalia and anus.

Diphtheria in the immunized is mild and usually presents as a few discrete specks of exudate in the tonsils simulating follicular tonsillitis.

COMPLICATIONS

Neurological.—The incidence of diphtheritic paralysis varies from 10 to 20 per cent. Impairment of function in many cases is slight and may escape detection. The frequency and severity of paralysis are related to the severity of the attack and the day of disease on which antitoxin is administered. Paralysis is thus more common in severe attacks in which both throat and nose are involved. Paralysis occurs in about 40 to 50 per cent. of severe cases, 10 to 15 per cent. of moderate cases and about 2 per cent. of mild cases. It is rare in purely laryngeal and purely nasal cases of diphtheria.

Palatal paralysis is the most common form of paralysis and develops in the second or third week. The signs are nasal speech and regurgitation of fluids through the nose. Ocular paralysis may be observed in the third to fifth week. Paralysis of the ciliary muscle results in inability to read small print. The sixth cranial nerve is generally affected more often than the third, and squint and diplopia are commoner than ptosis. Severe cases may develop paralysis of the pharyngeal and respiratory muscles during the sixth and seventh weeks and give cause for anxiety. Pharyngeal paralysis is indicated by inability to swallow, coughing over feeds and pooling of secretions in the nasopharynx. Diaphragmatic paralysis is recognized by lack of movement of the upper abdomen. Peripheral neuritis involving commonly the lower limbs gives rise to ataxia and loss of the deep tendon reflexes six to eight weeks after the onset of the illness. Rarer forms of

paralysis are facial paresis, affection of the neck muscles and sphincters.

Cardiovascular.—Failure of the peripheral circulation with myocarditis may arise in the first week but occurs more commonly in the second or third week. Early signs are vomiting and restlessness. The face is pale and the pulse is very soft. Tachycardia or bradycardia may follow and the heart dilates. An early clinical sign is a diminution in intensity of the first sound at the apex. The blood pressure falls and there is diminished urinary output and enlargement of the liver. Gallop or triple rhythm is of grave significance.

Slight albuminuria is common during the first week but glomerulonephritis is rare. Anuria may occur in hypertoxic cases which develop cardiovascular failure and is of grave significance.

DIAGNOSIS

Diagnosis must be made on clinical grounds. It cannot be emphasized enough that diphtheria in itself is not a painful disease and careful examination of the throat should be a routine procedure in every sick child. It is inadvisable to await a bacteriological report on a throat swab from a young child without giving an injection of diptheria antitoxin unless the symptoms are very mild and the diagnosis of diphtheria extremely doubtful. Bacteriological diagnosis has its limitations, and a single negative culture does not exclude diphtheria. If the patient is sharply ill, it is advisable to give a moderate dose of diphtheria antitoxin rather than allow a diphtheritic infection to progress. The uniform character of the membrane in one continuous layer firmly adherent to the mucous membrane is pathognomonic if accompanied by cervical periadenitis and/or a blood-stained nasal discharge.

DIFFERENTIAL DIAGNOSIS

Vincent's angina.—As in diphtheria the onset is insidious with little or no pyrexia. Examination reveals a slough covering an ulcer on the tonsil. The mouth may be unhealthy and the gums red and swollen. A throat swab will reveal *Sp. vincenti* and *B. fusiformis.*

Pyogenic coccal infections.—The throat and soft palate are much more uniformly congested and the skin should be examined carefully for the presence of a rash. Sore throat is a prominent symptom, fever is high and the exudate, which may be uniform and resemble false membrane, is much softer, whitish or yellow in colour and easily wiped off by a throat swab. The associated lymph glands are enlarged and tender. In pneumococcal angina constitutional symptoms are severe and the exudate which is much darker and more friable than diphtheria membrane is often accompanied by sloughing.

Blood diseases.—(a) *Glandular fever.*—In the glandular type whilst sore throat is a common symptom and the fauces are inflamed, exudate may be absent. In the anginose type, sore throat and dysphagia are severe and the exudate on the tonsils may closely resemble diphtheria. Usually there is generalized lymphoplasia and enlargement of the spleen. A differential

white blood count will show a mononuclear leucocytosis and the characteristic atypical cells. The Paul Bunnell test (heterophil antibody) will confirm the diagnosis. It is important that the bacteriologist be informed if the patient has received horse serum in the form of an antitoxin so that he may carry out the necessary tests to eliminate a false positive reaction. (b) *Agranulocytic angina.*—The throat shows a whitish exudate and sometimes ulceration of the tonsil. There is no redness or inflammation and the fauces appear pale with a jelly-like uvula. The condition occurs in adults and usually there is a history of the habitual use of a drug containing the benzene ring. The agents which most commonly cause this serious condition are the amidopyrine group and less frequently the sulphonamides. Blood examination reveals leucopenia and absence of granular cells. (c) *Acute leukæmia.*—Ulceration of the fauces with exudate formation is sometimes seen in this condition in children. Other signs are anæmia, pallor, petechiæ or purpura and enlargement of the spleen. Diagnosis is made by examination of the blood.

Peritonsillar abscess.—Pain is severe and trismus is present, whereas in diphtheria there is no difficulty in opening the mouth, even in toxic cases. The unilateral tense painful swelling of the fauces and the pushing of the tonsil and uvula by the soft palate towards the opposite side is typical.

Herpangina.—This condition due to Coxsackie virus group A gives rise to soreness of the throat, vomiting and fever. Small white papules or vesicles 1 to 2 mm. in diameter with an areola occur on the anterior pillars of the fauces, tonsils, pharynx and edge of the soft palate. In Coxsackie A.16 infections, which mainly affect children under ten years of age, ulcers are also present on the tongue, cheeks and gums. Examination of the skin may reveal a maculo-papular or vesicular rash with a centrifugal distribution.

Adenovirus infections.—The pharynx and fauces are inflamed and purulent exudate may be present on the tonsils.

Thrush.—The lesions are white patches on the buccal mucosa, fauces and tongue which resemble milk-curds. Microscopic examination reveals the presence of mycelium and spores.

Syphilis.—A primary chancre or mucous tubercles in the form of 'snail track ulcers' may be mistaken for diphtheria. Other signs of syphilis are usually present and the Wassermann test will confirm the diagnosis.

Mumps.—Careful examination of the throat in every sick child will prevent the grave error of mistaking the 'bull-neck' of toxic diphtheria for mumps.

Laryngeal diphtheria.—The principal conditions to be excluded are catarrhal and spasmodic laryngitis, laryngitis of prodromal measles and acute laryngo-tracheobronchitis. Other conditions which are more rarely confused are laryngismus stridulus, retropharyngeal abscess, whooping-cough, congenital laryngeal stridor, foreign body in the larynx and papilloma of the larynx. It is wise to regard every child suffering from progressive laryngitis with faucial exudation and/or a blood-stained nasal discharge as

diphtheritic and to treat with immediate antitoxin. The various laryngeal affections can be differentiated by direct laryngoscopy and swabbing.

PROGNOSIS

The prognosis depends upon early diagnosis and efficient treatment with antitoxin. Fatalities are due to delay in recognition of the disease. Generally speaking, gravis and intermedius strains tend to produce severe attacks with rapid advance of toxæmia.

Signs of toxicity.—Extensive and old membrane with faucial œdema, marked cervical periadenitis, profuse rhinitis with general signs of prostration and facial pallor indicate a serious attack, and the prognosis is grave. In hæmorrhagic cases with a purpuric rash and bleeding from the mucous membranes the outlook is well-nigh hopeless. The early onset of peripheral failure and myocarditis is extremely serious. If the patient survives the first month of the disease the ultimate prognosis is reasonably good.

Except in cases of cardiac, pharyngeal and respiratory paralysis, no undue anxiety need be felt regarding the outcome of the various paralyses as they tend to recover spontaneously.

TREATMENT

On making a clinical diagnosis of diphtheria the practitioner must notify the medical officer of health and the patient is removed to an infectious diseases hospital. As complete rest, skilled nursing and close medical supervision are essential it is inadvisable to isolate and treat even mild attacks in the home.

Serum therapy.—Immediate administration of diphtheria antitoxic serum is essential. Dosage, which is a matter for extensive clinical experience, is determined by: (a) the extent and character of the membrane, (b) the presence or absence of faucial and palatal œdema, (c) the degree of periadenitis, (d) involvement of the nose, (e) the day of disease.

The doses recommended (L.C.C. Committee) are: for mild cases, 2000 to 10,000 units intramuscularly; for cases of moderate severity, 15,000 to 30,000 units intramuscularly or intravenously; for severe (toxic) cases, 50,000 to 100,000 units intravenously. If it is decided to administer more than 20,000 units, it is advisable to give the whole dose or at least part of it by the intravenous route. The outer aspect of the thigh is the best site for intramuscular injection.

Before injecting serum, one should always inquire into the history for asthma, allergic conditions or previous injection or serum. If serum is essential for an asthmatic patient the intravenous route must be avoided. In such cases the patient is given a series of gradually increasing doses subcutaneously every half-hour, starting with 0.1 ml. of 1 in 100 dilution. A syringe containing adrenaline, 1 in 1000, should always be kept at the bedside.

General management.—Absolute rest is essential on account of the risk of sudden heart failure. The patient must be kept flat in bed and forbidden the slightest exertion. One soft pillow is allowed. Adults and older children

are more contented if allowed to read large print or look at pictures. Children must be spoon- or cup-fed. Whilst severe cases and moderate cases, if they show signs of myocarditis, should be kept recumbent for eight weeks or longer, mild cases are allowed a second pillow at the end of the third week according to the condition of the cardiovascular system. Thereafter the patient is gradually propped up and may be allowed up in 'blankets' at the end of the fourth week. A careful watch must be kept for any marked change in the pulse rate, vomiting, faintness, pain or any paralytic symptoms. An electrocardiogram is invaluable in the evaluation of the physical state of the patient, both in the acute and in the convalescent stages. The diet should at first be fluid—milk, soup, milk pudding, ice cream and jellies—until the throat is clean. Glucose should be given liberally by mouth and intravenously in toxic cases. Gentle aperients may be administered to mild cases but enemas are given as required to severe cases. In young children the mouth should be cleansed after each meal with cotton-wool soaked in a warm solution of bicarbonate of soda (30 grains to 1 pint [3.2 g. per litre]). Discharges from the nose are gathered on gauze and burned. After each meal dishes must be sterilized by boiling. Penicillin has no effect on toxæmia and is no substitute for antitoxin. If concurrent secondary infection is present, penicillin (1 mega unit daily) should be administered.

When *cardiovascular failure* threatens, the foot of the bed should be raised. Cardiac vomiting necessitates the replacement of oral feeding by the administration of intravenous dextrose saline. If anoxia is present the patient should be placed in an oxygen tent. Marked restlessness, anxiety and epigastric pain, are relieved by hypodermic injections of morphine: 1/36 grain (1.7 mg.) for a child of two years, and 1/12 grain (5 mg.) for a child of ten years. In hypertoxic cases with peripheral failure and collapse associated with adrenal failure hydrocortisone sodium succinate (2 ml.), providing the equivalent of 100 mg. of hydrocortisone, should be administered intravenously in a 5 per cent. dextrose saline infusion and repeated as required. Blood transfusion has been recommended by Pugh and Williams (1941). Cardiac stimulants are of no value.

Respiratory paralysis.—Treatment in a mechanical respirator is required. Pharyngeal paralysis should be treated by raising the foot of the bed and the cessation of all food and drink by the mouth. Nasal feeding is essential. Mouth and throat secretions are removed at intervals by a vacuum pump. Severe cases which develop pharyngeal and respiratory paralysis are treated in a similar fashion to cases of bulbar poliomyelitis with respiratory paralysis: e.g. with tracheostomy and intermittent positive pressure. Paresis of the limbs requires physiotherapy in the form of massage, radiant heat and exercises.

Laryngeal diphtheria.—16,000 to 24,000 units of diphtheria antitoxin should be administered intravenously. A steam tent helps to allay spasm. If restlessness, dyspnœa and cyanosis are associated with marked recession of the chest wall, direct laryngoscopy with aspiration of membrane by a

suction pump and repeated as required is the best mode of treatment in the hands of the expert. Tracheostomy is preferable if obstruction is due to subglottic œdema rather than membrane.

Freedom from infection.—Three consecutive negative cultures from the throat and nose taken at intervals of two or three days can be accepted as a reliable criterion of freedom from infection.

Carriers can be treated with penicillin although erythromycin may be superior.

In 14 carriers who had failed to clear after two courses of penicillin, Forbes (1954) was successful after treatment with erythromycin, 200 mg. every six to eight hours for five days. Negative cultures were obtained in every case and a follow-up after three weeks failed to reveal any return of virulent organisms.

Should these procedures fail, persistent carriers should be examined by an ear, nose and throat surgeon with a view to removal of tonsils and/or adenoids.

PREVENTION

Control of outbreaks.—After isolation of the suspected case and disinfection of all contaminated articles, contacts should be examined for evidence of infection. The dangerous diphtheria carrier often has diseased tonsils or unhealthy mucous membranes. Contacts with rhinitis, otorrhœa or exudate on the tonsils should be isolated and throat and nose swabs taken of every contact. Those with positive swab reports should be given diphtheria antitoxin and isolated. In a closed community a daily examination of the throat and nose of every contact should be conducted for seven days, and a Schick test performed if the state of immunity is unknown. Schick-negative contacts should not return to school or work until two consecutive throat and nose swabs taken at an interval of forty-eight hours have been obtained and found to be negative. Schick-positive contacts should be given both active and passive immunity by an intramuscular injection of 1 ml. of diphtheria toxoid (F.T.) and 1000 units of diphtheria antitoxin, followed one month later by a second dose of F.T. Contacts with morphological *C. diphtheriæ* in the throat or nose are kept isolated and a virulence test of the organism carried out. Should the organism be reported non-virulent, the contact may be released from isolation and resume normal activity. If the organism is reported as virulent the carrier must remain in isolation until the carrier condition has cleared up.

Active immunization.—Full details of this will be found in the 'Proceedings of a Symposium on Immunization in Childhood' (1960).

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SMALLPOX

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Fortunately, in recent years there has been no serious outbreak of smallpox in this country, but a few cases have appeared from time to time. The early diagnosis of such sporadic cases helps materially to limit any outbreak and any suspects should be considered as medical emergencies. Immediate notification by telephone to the medical officer of health of any suspect is essential. He can then investigate the case and can call on the help of one of the Ministry of Health panel of experts to assist him in arriving at a diagnosis if there is difficulty. With the steady increase of air travel by which travellers can arrive in this country during the incubation period of the disease and the steady decrease in the number of vaccinated people in this country the possibility of smallpox occurring must always be borne in mind.

The disease is caused by a virus and two distinct clinical types are recognized. Variola major, the Eastern type, has always serious possibilities whilst variola minor, sometimes called alastrim, is a much milder illness. These types 'breed true' and an outbreak of one type does not give rise to cases of the other type. The virus is spread by direct infection from one person to another or by fomites. A sporadic case arising in the vicinity of a smallpox isolation hospital on more than one occasion has suggested the possibility of aerial spread. This has been much debated but it is more probable that infection has been carried by fomites although proof of such a source cannot be established.

PRODROMAL STAGE

The accepted limits for the incubation period are from seven to fifteen days, but smallpox has the most constant of all incubations the symptoms usually starting on the twelfth day after contact. The onset is sudden with a pyrexia of 102° to 104° F. (39° to 40° C.) associated with shivering and rigors. Severe headache is present and often vomiting particularly in children. In the majority but not in all cases there is a low back pain across the sacrum, which may be most distressing to the patient. It is described as stabbing and when present is a helpful feature in diagnosis. Anorexia, insomnia, delirium, and convulsions in children are usual as in all febrile illnesses. Prodromal rashes are not uncommon and may be erythematous or petechial. The commonest is an erythematous morbilliform rash seen on the trunk, being particularly dense in the groins and axillæ, and in a few cases may appear on the face. A firm diagnosis of measles at this stage may delay recognition of the more serious complaint. Less commonly, and

usually in toxic cases, a generalized scarlatiniform rash which covers the whole body is seen. It has been given the name of the 'lobster rash' and is of grave prognostic significance. The petechial rash when it occurs is diagnostic on account of the peculiar distribution which gives it the name of the 'bathing drawers' rash. It is seen in the area covered by the briefest of pants and may extend upwards in the flanks to the axillæ.

STAGE OF ADVANCE

On the third day of the illness the true rash begins to appear on the forehead along the hair line and on the back of the wrists and hands. In the early stages it is macular but rapidly becomes papular and for the second time may be confused with measles. More than one outbreak in this country has been caused by a case being brought off a ship with the mistaken diagnosis of measles. The rash spreads to involve the face, limbs and trunk. With the appearance of the rash the temperature starts to subside. After three days the vesicles begin to develop. If careful watch is kept on the buccal mucous membrane and the palate, vesiculation may be seen earlier as the process of maturation of the enanthem is more rapid than that of the skin. Laryngitis may occur at this stage due to the presence of lesions in the larynx and in some cases tracheotomy may be necessary to relieve obstruction.

When fully developed, the rash shows a characteristic distribution. The lesions are more profuse on the face and hands than on the trunk, and in the case of the upper limb more lesions will be seen on the back of the hands and wrists than on the forearms and more on the forearms than on the arms. The protected areas of the body show many fewer lesions than those which are not protected. The axillæ, for instance, are only involved in cases with very profuse eruptions and indeed the avoidance of the axillæ in the average case is one of the points to be noted in diagnosis. The groins, the flanks and the intermammary groove are sparsely involved in comparison with the rest of the trunk. Any area which is exposed to friction, such as underneath a watch strap, a garter or even a pair of braces, will cause an increase in the density of the lesions. The prominences of the face will be more heavily involved than the depressions such as around the eyes.

The individual lesions are typically round and set deep in the skin so that they can easily be palpated between the thumb and finger. They may be surrounded by a red areola. The vesicles are multilocular and when distended with fluid the centre is held down by fibrinous strands: this produces the umbilicated appearance which is a feature of the eruption. The varying density of the rash, particularly on the face and arms, has led to the classification of discrete, semi-confluent and confluent types. In the semi-confluent type the lesions are packed so closely together that there is little or no healthy skin visible between them. In the most severe or confluent eruptions the individual lesions run together to form large blisters. Hæmor-

rhage into the vesicles occurs in severe cases and reduces the chances of survival.

By the ninth day of the illness the contents of the vesicles become cloudy and the patient enters the pustular stage. The temperature, which for the previous two or three days has been normal or only slightly raised, starts to rise again as the secondary fever begins. During the following three days the pustules become tense; as a result the umbilicated appearance disappears and by the twelfth day they start to rupture as the tension increases further or they burst because of friction. A thick yellowish honey-like material is liberated which has a most unpleasant odour. This dries to form a dark brown crust. The period of the 'secondary fever' lasts till about the sixteenth day and the patient is extremely miserable. The pulse rate rises to 120 to 140 a minute. Itching may become unbearable and insomnia is the rule. Delirium occurs and some cases are difficult to keep in bed and need restraining. As the fever progresses a state of exhaustion sets in and death, when it occurs, commonly takes place on the thirteenth or fourteenth day of the illness.

STAGE OF DEFERVESCENCE

When the secondary fever ends, except in the most severe cases the patient rapidly regains his strength. Isolation must be enforced until all the crusts have separated. The more superficial lesions will separate quickly leaving a shallow discoloured scar which slowly fades, but those deeper in the skin, particularly in the soles of the feet, in the palms of the hand and in the scalp, may take eight or more weeks to separate and in some instances may have to be removed by needling. The virus is known to be able to survive in crusts for many months; hence the necessity to ensure that all are removed before the patient is discharged.

CLINICAL TYPES

As with other infectious diseases smallpox shows a wide range in severity from the very mild case which may be easily missed to the very severe which may be fatal before the true eruption has time to develop. The varioloid or ambulant type is found in individuals whose immunity from vaccination is beginning to weaken. They incubate the disease and may have quite a sharp prodromal illness but the rash may never develop or be only a few atypical lesions. The opponents of vaccination stress the risk of this type of case being missed and thus spreading the disease. The toxic type is characterized by extreme prostration from the first, the victim often being admitted to hospital on the second or third day of the illness. The face is devoid of all expression, the eyelids puffy and the mouth, surrounded with sordes, held half open. All the muscles are toneless and it is an effort to move them. Hæmorrhages appear as petechiæ on the skin and mucous membranes as early as the second day and these are followed by ecchymoses.

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Epistaxis and subconjunctival hæmorrhages are common. Bleeding from the bowel is usual and hæmatemesis and hæmoptysis may be seen. The mind is often clear and the patient is acutely conscious to the end. Death takes place from the fourth to the seventh day of illness. In those cases which survive long enough for the appearance of a rash it is ill developed, the vesicles being flat and empty.

COMPLICATIONS

Infections of the respiratory tract are common. Reference has already been made to laryngitis. Most cases have some bronchitis, and broncho-pnuemonia is common in the confluent case. Myocarditis occurs early in the toxic variety and is also found in the stage of the secondary fever. All degrees of infection of the eyes can be encountered. Conjunctivitis is always present and in neglected cases keratitis, iritis and even perforating ulcers can occur. If the disease is contracted during pregnancy abortion is the usual result. Orchitis may be seen during the secondary fever. As with other virus infections encephalomyelitis may be a complication, starting between the seventh and thirteenth days of the illness.

DIAGNOSIS

Early diagnosis may not be easy even when the possibility of smallpox is not forgotten. The vaccination state must be considered. If vaccination has been successfully performed within two years the possibility of smallpox is remote. Vaccination histories are not always accurate, however, and careful questioning is necessary to ascertain the true position. It is difficult to assess the age of a vaccination by looking at the scar.

The sudden onset with headache and shivering and severe low back pain are suggestive in the early stage of the disease. The characteristic prodromal rashes when present are helpful. As the true rash appears the morbilliform character on the forehead may mislead but the presence of lesions on the back of the wrists and hands should help to exclude *measles*. The marked difference in the prodromal symptoms between the two conditions should help in the differential diagnosis. Examination of the mouth will reveal the absence of Koplik's spots and possibly early vesiculation will be observed.

The differential diagnosis from *chickenpox* may cause some difficulty particularly in the milder cases. Adults suffering from chickenpox, unlike children, may have prodromal symptoms with an elevated temperature. Severe backache, however, is not a feature of chickenpox. The distribution, both relative and total, and the character of the eruption are the points on which most stress must be placed. Chickenpox distribution is centripetal in contrast to the centrifugal eruption in smallpox. Normally chickenpox lesions are found in the axillæ which are avoided in smallpox. In chickenpox the lesions are superficial, not deep in the skin as are those of smallpox. The chickenpox lesions appear first on the trunk and the typical lesion is

oval with crenated margins and they appear in crops over about four days. Maturation of the chickenpox lesion is much faster and papules and crusts can be seen in juxtaposition whilst in smallpox the lesions in any one area are all at the same stage of development although those on the face and forearms may be in advance of those on the lower half of the body.

Confusion in diagnosis arises on occasions with *erythema multiforme* particularly in the Stevens-Johnson syndrome in which the eruption tends to be centrifugal suggesting the possibility of smallpox. The associated conjunctivitis, sometimes with subconjunctival hæmorrhage and stomatitis with blood-stained lips, may add to the picture of similarity. The patient, however, is not as ill as the smallpox one and the variety of lesions present in any one area is against the diagnosis of smallpox.

The varioloid type is extremely difficult to diagnose, especially when there is no history of contact and the sparsity of lesions, which are ill formed, may be confused with acne. In the latter condition there is no evidence of general constitutional disorder.

LABORATORY INVESTIGATIONS

It is now possible to get aid from the virologist in confirming or disproving the clinical diagnosis. Three methods are available.

(i) The most reliable is that of growing the virus on the chorio-allantois of a fertile hen's egg. This takes forty-eight to seventy-two hours from the receipt of the specimen of scrapings or vesicle fluid. The appearance of the growth can distinguish clearly between smallpox and vaccinia.

(ii) A complement-fixation test using scrapings of vesicle fluid from the patient as antigen against a highly immune anti-vaccinial serum from a rabbit will prove positive for both smallpox and vaccinia. The report will be available within twenty-four hours of receipt of the specimen. If the subject is unvaccinated a positive result would be diagnostic, but the vaccinial history must always be taken into account when interpreting the result.

(iii) The quickest but least accurate test is to examine on a slide a smear from the lesions. This can be stained by a modified Paschen stain and the elementary bodies seen under the microscope and compared with a known smallpox smear. A result by this method could be given within an hour of receipt.

TREATMENT

Smallpox is best treated in a special hospital for the purpose. Although the theory of aerial spread is not usually upheld, smallpox is a highly infectious condition and it is necessary to treat it in a hospital where the staff are isolated from others and from which no articles can be removed unless satisfactorily disinfected. It is, of course, essential that all staff dealing with the patients should be kept fully vaccinated and that any person who has to enter the hospital is likewise immune.

There is no specific treatment for smallpox yet available, and treatment has therefore to be symptomatic. Wide-spectrum antibiotics have no effect on the normal course of the disease but may help at the stage of the 'secondary fever' to prevent secondary bacterial infection occurring in an

already debilitated patient. Bed rest and good nursing, preferably in a darkened room, are essential. In the early stages sedatives will be required for insomnia and delirium, and on occasions the backache is severe enough to require morphine. Ice packs will relieve headache, and tepid sponging is helpful in cases of hyperpyrexia.

When the rash appears daily baths, to which potassium permanganate has been added, may alleviate irritation. A light mask soaked in ice water and kept moist may ease the face. The toilet of the eyes and mouth must be attended to frequently. Feeding will be difficult and painful and require a fluid diet. The use of various ointments for local application to the skin has been advocated; the best of these is carbolized petroleum jelly with iodoform added when the pocks rupture, to counteract the offensive odour. The treatment of complications as they arise should follow normal lines.

When the temperature subsides the patient will regain strength rapidly on a nourishing diet.

PROPHYLAXIS

If it were possible in any community to enforce primary vaccination in infancy and revaccination at five-yearly intervals smallpox could be eliminated from that community, but it would be extremely difficult in any circumstances and most of all in a democracy. Primary vaccination is best performed between three and six months of age, and even if revaccination is not performed the prognosis in the event of developing smallpox is much better than in the unvaccinated. The outstanding contraindication to vaccination is the presence of eczema. Severe reactions may occur if primary vaccination is left until adult life.

When a case of smallpox is diagnosed all close contacts should be vaccinated as soon as possible, irrespective of their vaccinial history, and kept under daily surveillance for at least fifteen days. Mass vaccination will only be required in the event of an outbreak getting out of control. If successful vaccination can be carried out within twenty-four hours of contact full protection will be almost certain. The longer the delay the more likely is the chance of developing the disease. The place of hyper-immune gamma globulin in prophylaxis is not yet established but it should certainly be given to unvaccinated contacts if delay has occurred before vaccination or in the event of vaccination not producing a 'take'. Even though full protection does not result, the severity of the disease will be considerably reduced.

CHICKENPOX

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It would seem hard to find something fresh to say about this ancient infectious exanthem. Yet, even if much of what is said may seem to be variations on old themes a review is worth while, for some of the concepts in regard to chickenpox are applicable to other exanthemata such as measles and rubella.

VIRUS ISOLATION

Although varicella must have been one of the earliest infections to be ascribed to a virus, until comparatively recently the evidence depended on the demonstration of eosinophilic intranuclear inclusion bodies in tissues inoculated with infected material. More recently the application of roller-tube tissue culture techniques has resulted in virus isolation and serial passage from material obtained from vesicle fluid. Such experiments, combined with the examination of acute and convalescent sera, have clearly shown the identity of the virus and have also confirmed the clinical concept of the close affinity of chickenpox and herpes zoster. Unfortunately the technical difficulties in isolation of varicella virus are greater than with many other viruses and this, combined with the general mildness of the disease, has not encouraged a wide interest in the use of such methods in diagnosis.

CLINICAL AND VIROLOGICAL DIAGNOSIS

The differential diagnosis of chickenpox and smallpox must always have relevance for it is true that in the past twenty years the primary case in every outbreak of smallpox in Great Britain has been originally regarded as an apparently undoubted case of chickenpox. There are now few clinicians in Western European countries with the extensive day-to-day experience of smallpox which produces a real awareness of all its varied clinical forms, and it is seldom appreciated that in the previously vaccinated person smallpox may break all its own diagnostic rules. It is therefore fortunate that additional tests are now easily available which can give precision to the diagnosis. It is absolutely imperative nowadays to perform these simple tests when doubt arises.

In order to carry them out good smears must be prepared from early lesions, preferably at the vesicular stage, although the examination of the juice from papular lesions may also be used. The vesicle should be ruptured with the point of a sharp scalpel, and the contents 'milked' out with its edge. A number of smears (preferably half-a-dozen) should be made on to clean glass slides and allowed to dry. Heat must not be applied.

One of the smears should be stained by Giemsa and examined for the presence of multi-nucleated giant cells. These cells are usually numerous in the vesicle fluid of chickenpox, herpes zoster and herpes simplex, but are not found in smallpox. This is undoubtedly the simplest of the tests

for with some experience these large cells are readily recognized and their presence excludes the likelihood of smallpox. If giant cells are not found, examination for elementary bodies should follow, for the elementary bodies of smallpox are large enough to be seen, after appropriate staining, with the ordinary oil-immersion lens. This test demands that the smears be well made and free from pus, blood or excessive debris—and considerable experience with the staining and examination. Although any clinician in this country can rapidly acquire the experience to examine smears for the presence of giant cells, the examination of smears for elementary bodies should usually be left to the virologist. The demonstration of elementary bodies will therefore strongly support a diagnosis of smallpox and indicate the need to isolate the patient. The more precise examinations, either by complement-fixation tests or by growing the virus on the chorio-allantoic membrane of chick embryos or on tissue culture, will confirm the diagnosis but take rather longer. Smear material is suitable for these tests and it is for this reason that several smears should be submitted.

These examinations are so relatively simple that it is in the highest degree undesirable nowadays for clinicians to engage in an elaborate exercise of differential diagnosis. If the circumstances of the history suggest the possibility of contact, or the appearance of the rash is such as to raise the possibility of smallpox, laboratory tests *must* be carried out.

CHICKENPOX-LIKE INFECTIONS

The more extensive application of such techniques has shown that all is not chickenpox that is infectious and produces a vesicular rash. First of all there has been the appreciation that *generalized herpes simplex* is commoner than was thought and may produce a similar type of rash. It may be indeed that simplex infection is occurring at a rather later age and that this produces a greater tendency to systemic dissemination. *Herpes zoster* may be complicated by a generalized varicellar rash and this combination seems commoner than it used to be—perhaps another reflection of the increasing age-expectation of the population. But generalized herpes zoster is in fact chickenpox and liable to produce this infection in susceptible contacts.

Perhaps the most interesting aspect of expanding knowledge, however, is the growing appreciation that other virus infections (adenoviruses and enteroviruses) may present macular or vesicular eruptions which closely simulate the rashes of rubella and chickenpox. In this regard some ECHO and Coxsackie A types seem to be especially likely to produce vesicular skin eruptions with the centrifugal distribution of chickenpox. It seems not impossible that as in poliovirus infection improved standards of hygiene permit the infant to escape infection with these viruses while still to some extent covered by maternally transferred antibody. Infection in later childhood may produce a more overt illness. One recalls that in the past macular and vesicular eruptions were not too uncommon in the first year of life and were often described somewhat loosely as 'hives' or 'teething rashes'.

Further, these newly recognized causes of vesicular eruptions may serve to explain the occasional history of second attacks of chickenpox.

So far, extensive epidemics of these enterovirus infections accompanied by vesicular eruptions have not been common. But this should serve to encourage a wider application of virus studies in groups of cases presenting vesicular eruptions, for it must be appreciated that the clinical diagnosis of chickenpox is sometimes less certain than it seems.

SEVERE CHICKENPOX

Apart from the rare occurrence of encephalitis, chickenpox has long been regarded as one of the mildest of the infectious diseases, but in recent years a considerable number of cases have been reported in which a primary varicellar pneumonia has been a main complication, sometimes causing death. Previously, no doubt, pneumonia occurring in chickenpox became rapidly superinfected by bacteria so that, even at necropsy, the evidence which would suggest a virus infection of the lungs would be lacking. The antibiotics, however, are now available to deal with the bacterial aspect of the infection so that death is more obviously due solely to the viræmic assault. And death, with widespread evidence of virus damage, can no longer be regarded as a rare occurrence. Indeed, most infectious disease specialists would agree that they have seen more deaths from chickenpox during the past five years than in the previous fifteen. In some of these severe cases the patient has been receiving steroid therapy or has undergone extensive radiation therapy, but this is not an invariable history. These severe forms of chickenpox seem to be encountered more often in the adult.

It is difficult to ascribe a reason for this change. It seems improbable that a variant form of virus is responsible, for these severe cases can arise from contact with mild cases, and do not, in their contacts, produce similarly severe reactions. Their more frequent occurrence in adolescents and young adults and the association with preceding steroid therapy must indicate that the fault lies in the more florid response of the older host; and it must seem somewhat paradoxical that a number of clinicians attest the value of prednisolone in the treatment of the patient with varicellar pneumonia. Such reports would suggest that, when varicella occurs in a person who is receiving steroid therapy, the correct course to follow should be to increase the dose of steroids.

The indication that the severer forms of chickenpox occur in the adolescent or adult should engender some caution against the still common practice of delaying the age of attack. In the past the heavy mortality from infectious diseases, in general, naturally induced the reaction that the child should always be protected from exposure to any of them, but in these healthier times it may be desirable to adopt a new perspective and to regard varicella, along with mumps, rubella and perhaps even measles, as infections to be achieved in childhood. If this is so then many school authorities need to look afresh at their tables of isolation and quarantine.

MEASLES

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Unlike other common infectious diseases, measles continues unabated, with an epidemic prevalence every two years in all large centres of population. Its incidence is shown in the following figures for notified cases, from the annual reports of the Chief Medical Officer of the Ministry of Health:—

	1951	1952	1953	1954	1955	1956	1957	1958	1959
No. of cases	616,192	389,502	545,050	146,995	693,803	160,556	633,678	259,308	539,524
No. of deaths	317	141	242	45	174	28	94	49	98
Fatality ratio	0.05	0.04	0.04	0.03	0.03	0.02	0.01	0.02	0.02

PATHOGENESIS

Measles is caused by a specific virus discovered by Enders in 1954. According to current theory the virus enters the upper respiratory tract, and invades the blood stream causing a primary viræmia for a few days. The virus then settles in the reticulo-endothelial system, where it multiplies giving rise to a massive secondary viræmia, which results in the classical symptoms of the disease. The virus appears to render the mucosa of the respiratory tract particularly susceptible to secondary invasion by bacteria: e.g. streptococci, pneumococci, and *H. influenzæ*.

It is essentially a disease of young children, mainly of the toddler age. The poorer the environment the greater the number of children who contract the disease and at an earlier age. In middle-class families, the maximum incidence falls on the children of school age. In isolated communities, adults as well as children can be attacked. In an epidemic in Greenland in 1951, the morbidity was 99.9 per cent. and the mortality rate 1.8 per cent.

Spread of the disease.—The virus can be recovered from the upper respiratory tract in the pre-eruptive and early eruptive stages of the disease. The catarrhal nature of the early stage with coughing and sneezing causes the dissemination of virus in the expelled droplets over considerable distances. The disease is produced in a susceptible child by inhalation of infected droplets or droplet nuclei. The infectivity of measles in the prodromal and eruptive stages is about as high as chickenpox.

Incubation period.—The interval between infection and the first sign of illness is most commonly eleven days with a range of ten to fourteen days.

During this period, although usually silent, there may arise symptoms of fever, anorexia, cough, abdominal pain, vomiting and a transient rash. These symptoms probably correspond to the primary viræmia and are only seen in a minority of cases. This gives rise to what is known as the 'biphasic illness', as these cases subsequently develop a typical attack at the usual time.

SYMPTOMS

In most cases, measles begins like an acute cold with sneezing, coughing, and lacrimation. The temperature rises steadily for three or four days. Before the typical measles rash appears prodromal rashes are sometimes seen. The commonest form resembles the rash of scarlet fever. A sparse rubella-like rash may also be seen. These prodromal rashes may disappear before the characteristic mucous membrane appearances in the mouth are manifest (Koplik's spots), thus causing difficulties in diagnosis. The most important diagnostic sign in early measles is the appearance of Koplik's spots on the buccal mucosa. These spots appear opposite the lower molar teeth and range from three or four minute red areas, with pale centres, to such numbers as to produce a confluent area resembling ground glass. They are best seen by natural light. In very young children, Koplik's spots are sometimes confused with patches of thrush or milk flakes, which in contrast are easily removable. Dull red blotches may occasionally be seen on the soft palate similar in character to the exanthem of measles. Changes in the appearances of the tongue in early measles are apt to be confused with those of scarlet fever and the characteristic exfoliation occurs in both, probably due in both cases to the presence of hæmolytic streptococci.

The exanthem of measles begins after three or four days of upper respiratory symptoms, coryza, cough, and conjunctivitis and in young infants, with enteritis. A few fine macules appear behind the ears and on the forehead. The eruption rapidly spreads over the face and then on to the trunk and limbs. The lesions are often papular as well as macular and coalesce to form irregular, dusky red blotches. Hæmorrhagic elements are often present in heavy eruptions. When the rash fades in about a week, a characteristic staining of the skin remains, which may be due to altered blood pigment.

The temperature is at its highest just before the rash appears and steadily declines to the end of the illness unless a complication occurs. The rash, except for the staining, fades in about a week. During this period the respiratory symptoms and conjunctivitis rapidly abate and after ten days of illness the patient is convalescent.

Rashes which are sometimes mistaken for measles are rubella, scarlet fever, smallpox, allergic rashes due to drugs or food, and erythema multiforme.

TREATMENT

Measles is essentially a virus infection with bacterial complications. For the uncomplicated case, there is at present no specific therapy (i.e. an anti-viral drug) and the treatment is largely symptomatic.

'Virugon' (N^1,N^1-anhydrobis-(β-hydroxyethyl) biguanide-hydrochloride 100 mg., with atropine methonitrate 0.1 mg., and hyoscine methonitrate 0.1 mg.) has been extensively used in Scandinavia, for the treatment of influenza and, to a lesser extent in the United States for the treatment of herpes zoster, mumps, measles and chickenpox. It has been claimed that it modifies the course of the illness in these viral infections. Early this year, clinical trials of the drug were made in this country on cases of measles admitted to hospital and the results are awaited with interest.

The routine use of sulphonamides or antibiotics for the ordinary healthy child undergoing an attack of measles, is not recommended. If the child is not healthy, particularly if he is 'catarrhal', or shows abnormal physical signs at the onset of measles, antibiotics and sulphonamides can each be of some benefit in selected cases. In a previously healthy child under two years, if an antibacterial drug is required, an antibiotic rather than a sulphonamide should be used, because pulmonary rather than aural complications are more likely to occur. If pulmonary complications are anticipated, an antibiotic, e.g. penicillin, should be used. If otitis media is present or expected, sulphonamides may be of more benefit than antibiotics. The greater the degree of severity of the attack, the more benefit is conferred by suitable antibacterial prophylaxis. These recommendations are the result of an investigation undertaken by the College of General Practitioners in 1956.

Patients with mild attacks recover quickly if kept warm in bed for a few days. Plenty of fresh air should be insisted upon. In the early stages the diet should consist mainly of milk and as much bland fluid, such as sweetened fruit drinks, as the child can be persuaded to take. A simple linctus or Dover's powder may be necessary to control a troublesome cough. Attention to the hygiene of the mouth and the eyes is important as this may prevent the occurrence of bacterial complications: e.g. otitis media and purulent conjunctivitis.

COMPLICATIONS

Broncho-pneumonia is the outstanding complication of measles and the fatality rate of measles is governed by the incidence of broncho-pneumonia. Antibiotic therapy is required in full dosage, beginning with penicillin by intramuscular injection every six hours. If this fails to improve the condition after forty-eight hours, a change to a broad-spectrum antibiotic is necessary: e.g. chloramphenicol or tetracycline. An oxygen tent will be required in cases with cyanosis, and heart stimulants are occasionally necessary. Cases of giant-cell pneumonia associated with measles virus infection, which proved fatal to children who were debilitated by other diseases, have recently been reported in the United States.

Involvement of the central nervous system occurs in measles. The pathogenesis and the histological changes are similar to those of other specific virus diseases, producing an encephalitis, meningo-encephalitis or encephalomyelitis. Symptoms of involvement of the central nervous system

may arise at the height of the attack or when the temperature has returned to normal. The onset is usually sudden; in very young children, a convulsion may occur. Older children may complain of headache. The child may become irritable or delirious, but more often drowsy. Twitchings and myoclonus are characteristic. Meningeal signs may be present. The attack usually subsides completely after a few days, but may persist and ultimately be followed by residual damage to the central nervous system. The cerebrospinal fluid is clear, and under normal or increased pressure with a moderate increase in the lymphocytes. The results of treatment with immune serum, gamma globulin, or intravenous infusions have been variable.

PREVENTION

Measles is highly infectious in the early or catarrhal stage before the rash appears. Infectivity rapidly declines after the appearance of the rash and a child is no longer infectious after the tenth day of illness. In the home, the child with measles should be isolated from other children, especially the very young. Removal to hospital is only desirable if the home conditions are unsatisfactory or if complications develop. Contacts require supervision but no restrictive quarantine is necessary.

Protection of exposed susceptibles.—When it is necessary to protect exposed susceptible individuals, as in institutions or hospital wards, or in cases in which the child is debilitated from another illness, the use of gamma globulin is recommended. If gamma globulin is injected into a measles contact early in the incubation period, the development of the disease may be either prevented or modified, according to the size of the dose given. The immunity given by the 'protective' dose (15 mg. per pound [33 mg. per kg.] body weight) lasts only a few weeks. The smaller 'modifying' dose (3.5 mg. per pound [7.7 mg. per kg.] body weight) reduces the attack to a mild transient form, and permanent immunity appears to result.

Immunization.—An attenuated measles virus vaccine produced by Enders and Peebles (1954) in the United States, was used by Hoekenga and his colleagues (1960) in Panama in 1959, where measles is endemic. The vaccine was given by intramuscular injection but reactions were common: 70 to 80 per cent. of children under the age of 5 had fever and a macular rash. Older children and adults had no reaction. All ages produced a satisfactory antibody response. Similar results were reported by Smorodentsev and his colleagues (1960) in Leningrad, who also noted that the modified measles they induced was non-contagious.

Further research on the attenuation of the virus and its related immunological response is required before a safe and effective measles vaccine can be considered for general protection against the disease, but the future control of measles is a step nearer.

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SCARLET FEVER

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ALTHOUGH scarlet fever has been known at least for centuries it was only some thirty-five years ago that its true nature was at last understood. Dochez and the Dicks then finally established the hæmolytic streptococcus as the cause of the disease, Dochez by producing a similar disease in guinea-pigs, the Dicks by swabbing the throats of human volunteers with material from the throats of scarlet-fever patients. The Dicks also worked out the role of the soluble erythrogenic toxin in the production of symptoms, standardized a toxin for use in a skin test of susceptibility (the Dick test) and as a means of immunization, and produced an antitoxin as a prophylactic and therapeutic agent in the management of the disease. Most of this work was published in 1924 and 1925, at a time when scarlet fever was still a disease of major clinical importance. The disease has since declined markedly in virulence, and antitoxin has been replaced by sulphonamides and penicillin, but the work is still the basis of an understanding of the disease and its epidemiology.

ETIOLOGY

About the same time, work was going on on the classification of hæmolytic streptococci, work associated in this country with the names of Lancefield and Griffith. It became clear that only group A hæmolytic streptococci are concerned in the disease and that there are many types in this group—at present at least forty are known. Not all of these types are equally common as causes of scarlet fever and not all produce the same amount of toxin. Infection with a hæmolytic streptococcus produces two kinds of immunity in the human: antibacterial immunity against the streptococcus itself, and antitoxic immunity against the erythrogenic toxin. Antibacterial immunity is type-specific: i.e. a person immune to *one* of the forty types of group A streptococci may not be immune to the other thirty-nine and may be re-infected by any one of them. On the other hand, antitoxic immunity tends to be group-specific: i.e. immunity developed against the erythrogenic toxin of one type of streptococcus tends to protect against the toxin of all the types; this group immunity is not quite complete—there may be more than one erythrogenic toxin, and the streptococci vary in their ability to produce toxin so that immunity developed against a weakly toxigenic type may not be sufficient to protect against a more powerfully toxigenic strain.

These findings made clear many of the clinical and epidemiological puzzles of scarlet fever. As long ago as 1861 Trousseau remarked: 'Scarlet fever may not appear on the skin: it is not less serious on this account'. He also described how some members of a family suffered from sore throat

without eruption and were thereafter immune to scarlet fever whilst others around them were violently attacked by the disease. It is now clear, of course, that streptococcal tonsillitis and scarlet fever are two manifestations of the same infection and that a patient, immune to the erythrogenic toxin, may suffer from streptococcal infection without a rash yet prove infectious to others who, not having antitoxic immunity, develop scarlet fever with a typical rash.

Equally important was the application of these studies to the problem of 'relapses' in scarlet fever. Such 'relapses' were commonplace in scarlet fever wards some twenty-five years ago, occurring about the end of the third week of illness when the patient began to be allowed up and to move about the ward. Sore throat developed in a day or two and not uncommonly a rash, and the patient returned to bed with a ' relapse' or 'recrudescence' of his disease. Careful investigation of the types of streptococci involved in these incidents, however, showed that in the majority a streptococcus different in type from that present on admission was the cause of the patient's condition and that the relapse was in fact a reinfection derived from other patients in the ward. The rash may have been due to infection by a more powerful erythrogenic type of streptococcus, but may also have been due to the use of antitoxin in the original infection: this, while counteracting the toxin produced by the throat infection, may at the same time have interfered with the production of the patient's own active immunity against the toxin, so laying him open to attack by the toxin when the level of foreign antitoxin dwindled at the end of three weeks. Whatever the exact mechanism cross-infection was a major problem and there is no doubt that had not the sudden decrease in the virulence of the disease—sudden in a comparative sense—led to a steep fall in the admission of cases, 'open' wards for scarlet fever patients would have become difficult to justify on either medical or medico-legal grounds.

CLINICAL FEATURES

So much for the history—essential for an understanding of the disease. What of scarlet fever in this country today? It is rarely other than a mild illness. The onset is abrupt with sore throat, pyrexia and often vomiting. After a day or two the typical rash develops: a smooth erythema with superimposed minute pinnacles or puncti-punctate erythema. The rash begins on the neck and spreads rapidly over the body. The cheeks are usually flushed but the punctation is not usually seen on the face. The area around the mouth escapes but this famous circum-oral pallor is not exclusive to scarlet fever; it is common in any toxic condition, especially pneumonia, and is sometimes quite marked even in measles. The tongue becomes covered with a thin fur, which shortly strips off, leaving the typical peeled papillated tongue of scarlet fever. The tonsils and uvula are red and swollen and often there is white exudate on the tonsils. After a day or two the

symptoms subside and in a few more days the child feels quite well again, although sometimes debility is prolonged. With modern treatment complications are rare.

DIFFERENTIAL DIAGNOSIS

As regards diagnosis, a well-marked case can scarcely be mistaken. When the rash is poorly developed it may be missed and the diagnosis then rests between streptococcal and other forms of tonsillitis. No-one can diagnose these clinically with certainty but, with experience, one can make a fairly accurate guess. Glandular fever is one of the commonest non-streptococcal types of tonsillitis seen today: there is usually abundant thick exudate or membrane more likely to be mistaken for diphtheritic than streptococcal inflammation, the cervical glands are usually markedly enlarged, and there may be considerable nasal congestion and discharge, the throat and nose condition together leading to some respiratory distress; yet withal there is often very little pain. Very severe streptococcal tonsillitis may present a similar picture, but in this condition the pain is severe. Vincent's angina, secondary syphilis and tonsillo-mycosis are rarely seen nowadays, but outbreaks of tonsillitis are not infrequent in which no common pathogens are isolated from throat swabs and these are sometimes shown to be due to infection by one or other of the respiratory viruses.

The commonest rash mistaken for scarlet fever nowadays is probably a drug rash. This is usually coarse and macular but sometimes penicillin produces a fine erythema almost indistinguishable from that of scarlet fever. The rash is often out of proportion to the other signs of infection and this may be the main clue to its nature. Rubella is another cause of difficulty and, when the two diseases are epidemic together, mistakes will be frequent. The rash of rubella is fine but definitely macular whilst that of scarlet fever is punctate, but there are cases in which even the experienced doctor remains undecided. The appearance of the throat usually helps, but some cases of rubella have exudate in the throat and many cases of scarlet fever have shotty glands in the neck.

TREATMENT

As regards the treatment of scarlet fever there need be no confusion. Hæmolytic streptococci resistant to penicillin are almost unheard of and penicillin is the correct drug to use. In order to eradicate the hæmolytic streptococci a therapeutic level of penicillin must be maintained in the patient's serum for ten days, and eradication is essential if the danger of rheumatic fever is to be removed. Such a level can be maintained in several ways. Penicillin can be given orally as phenoxymethylpenicillin in doses of 250 mg. every four hours, or as phenethicillin in similar doses, continued for ten days. The difficulty is to ensure regular dosage especially after the patient feels he has recovered. The same effect can be obtained by repeated

injection of benzylpenicillin or by using one or other of the long-acting penicillins. In hospital, the patient is usually put on oral penicillin, but as the patient may not be kept in for as long as ten days, an injection of long-acting penicillin is given the day before discharge: a combination of benzylpenicillin, procaine penicillin and benzathine penicillin, available in one ampoule ('triplopen') ensures a high level of penicillin during the last twenty-four hours in hospital and a continued level in the serum for many days after discharge. This ensures that the patient gets the necessary ten days' curative blood level and also prevents his becoming a source of infection to others after leaving hospital. It is wrong to use methicillin in scarlet fever as it is in fact less active than 'ordinary' penicillin against hæmolytic streptococci, and resistance to penicillin does not occur. Only if a patient is allergic to penicillin need any other drug be considered. Sulphonamides, although useful in the prophylaxis of streptococcal infections, are ineffective in the eradication of established infection. Tetracycline is probably the best alternative to penicillin but it is not equally efficient.

It must be emphasized that unless the patient is allergic to penicillin it is *wrong* to use any drug other than penicillin for the specific treatment of streptococcal infection.

GENERAL MANAGEMENT

With regard to the general management of scarlet fever, there is rarely any *medical* need these days for sending the patient to hospital. If he is immediately treated with penicillin he becomes rapidly—probably within twenty-four hours—non-infectious and will remain so if penicillin treatment is continued as indicated above. The problem of isolation is therefore greatly simplified. Sometimes, however, social reasons predominate or there may be some epidemiological problem, commonly imminent childbirth in the home, and hospital admission can then usually be arranged without difficulty. With regard to contact it is perfectly rational to give sulphonamides or penicillin to contacts at special risk: pregnant mothers or rheumatic siblings, for example. Institutional outbreaks, too, can be controlled by the use of sulphonamides or penicillin, but only after careful consideration. Far too much penicillin is already given for inadequate reasons. Exclusion from school or work depends on the views of the local authority concerned: the mildness of the disease, the occurrence of streptococcal infection equally infectious though without the rash, and the comparative ease of eradicating streptococci by penicillin should make such measures only rarely necessary.

WHOOPING-COUGH

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WHOOPING-COUGH has long been among the most lethal of the common infectious diseases of childhood and is still an extremely serious infection in infancy. Nevertheless, in the past ten years there has been a sharp fall in both incidence and mortality which has been particularly striking since 1957 (table I). It is a fair assumption that routine immunization in infancy, though not so dramatic as in the case of diphtheria, is largely responsible for this welcome trend.

Year	No. of cases notified	No. of deaths registered
1950	157,781	394
1951	169,141	453
1952	114,869	181
1953	157,842	243
1954	105,901	139
1955	79,133	87
1956	92,410	92
1957	85,018	87
1958	33,404	27
1959	33,253	25

TABLE I.—Whooping-cough, England and Wales in 1950-59. Number of cases notified and of deaths registered.

Incubation period.—This is usually 10 to 14 days but extremes of 4 or 5 to 21 days have been recorded.

Quarantine period.—A quarantine period should exceed the longest known incubation period by one week; quarantine for whooping-cough would therefore be 28 days. Universal immunization would reduce considerably the need to impose quarantine and there is virtually only one eventuality that requires its application. A nursery for infants and young children, incompletely immunized, should not admit further cases after whooping-cough has occurred.

The problems that remain to be faced in this disease may be discussed under three headings: (1) The importance of early diagnosis. (2) Prompt recognition and skilled treatment of complications. (3) Maintenance of immunization campaigns with, if possible, elimination of the hazards still attending the procedure.

EARLY DIAGNOSIS

The long catarrhal stage with tardy development of recognizable paroxysms has always presented a diagnostic problem. To this is now added the mild,

often subclinical, attack of the disease in the immunized child. Whilst this serves as an excellent 'booster' dose it renders diagnosis difficult and gives rise to the impression that the disease is changing its form. There is the further important clinical consideration that pertussis, diagnosed within ten days of onset, may be aborted by chloramphenicol. Hence, more than ever before, laboratory aids to diagnosis may justifiably be used and, indeed, prove of great assistance in doubtful cases. They consist mainly of (a) isolation of the causative organism and (b) study of the characteristic changes in the white blood cell count. It cannot be too strongly stressed that meticulous attention to detail in the performance of these tests is essential and they are therefore, admittedly, more suitable for hospital than for domiciliary practice; slovenly application only serves to bring the measures into disrepute.

To isolate *Bordetella pertussis*, as the causative organism is now known, it is necessary that swabs be taken within two weeks and preferably ten days of the onset and that the media be constantly checked.

The method employed in this department is to use a per-nasal swab and a cough plate containing Lacey's (1954) medium which must be fresh; cough plates older than one week are discarded. The cough plate is held approximately six inches (15 cm.) from the patient's mouth during a paroxysm which may be induced by extending the head, lightly pressing the thumb on the trachea and then sharply flexing the neck. The per-nasal swab should be taken *immediately after the paroxysm* as the organism is mostly found in the bronchial secretions.

With this method there is an 80 to 90 per cent. chance of isolating the organism in the first ten days of the illness. Later, the organism quickly disappears from the secretions, presumably as a result of antibody production.

The characteristic changes in the white blood cells consist of leucocytosis with relative and absolute lymphocytosis. These are a late development not usually evident until the second week but a series of counts at two- or three-day intervals may show the unmistakable trend.

Two further tests, not used routinely in this department, may be useful. In pertussis the erythrocyte sedimentation rate is normal or retarded, whilst in the later stages of the disease a rise in complement-fixing antibody may provide retrospective confirmation of the disease. Venepuncture is necessary for both tests and we consider this unwarranted in view of the superior value of the first two tests (the isolation of the organism and the blood count).

COMPLICATIONS

Whooping-cough in infancy, or complicated by involvement of the respiratory tract or central nervous system at any age, demands skilled treatment, preferably in a unit possessing all requisite facilities. In the infant the disease is always serious. Analysing 50 deaths that occurred in England and Wales in 1958 and 1959, Cockburn (1961) found that 28 per cent. were infants below 3 months of age and 52 per cent. below 6 months of age; in

all but three of these the pertussis was associated with broncho-pneumonia or other lung complications.

Respiratory complications.—The disease may present as a primary broncho-pneumonia with suppression of the paroxysms or the latter may take the form of apnœic attacks. Such cases are still not infrequently encountered and only a rigidly applied system of constant supervision can ensure a successful outcome. Such a system entails:—

(1) Patient feeding and re-feeding after vomiting. Failure to re-feed means loss of weight and diminished powers of resistance. It is wise to give small amounts frequently rather than to attempt long feeds.

(2) Instant attention at the onset of a paroxysm is imperative for the infant: failure to sit the child forward and ensure a clear airway may result in aspiration of mucus and death from asphyxia. Infants becoming cyanosed during a paroxysm or having apnœic attacks should be tipped well forward or even held up by the heels. In the most severe cases it is advisable to have two nurses in attendance, one to hold the child, the other to clear the airway.

(3) Oxygen tents should be used in all severe cases of whooping-cough even in the absence of pneumonia. This has the effect of reducing the number and severity of the paroxysms. Frequent paroxysms occurring both by day and by night prove exhausting: these patients should be given a small dose of phenobarbitone: say, ¼ grain (15 mg.) twice daily until the frequency has been reduced. It is bad practice to give so much barbiturate that the cough reflex is abolished as this conduces to viscid sputum with increased danger of collapse of lung.

(4) Chloramphenicol can effectively abort the disease, but to do so it must be used within ten days, preferably within a week, of onset and it should always be given in double the usual dosage. It is the drug of choice for primary pertussis pneumonia in which similar high dosage is necessary for at least forty-eight hours. For the more common secondary broncho-pneumonia, in which there is generally a mixed flora of streptococci, staphylococci and pneumococci, penicillin in doses of 250,000 units six-hourly, together with a long-acting sulphonamide, e.g. sulphamethoxy-pyridazine in doses of ¼ grain (15 mg.) daily for five days, proves consistently effective and safe. In more severe cases, particularly those in which *Hæmophilus influenzæ* has been isolated from sputum or post-nasal swab, chloramphenicol is essential. This drug, which is relatively easy to use in hospital where daily blood counts can be carried out, is not recommended for use in domiciliary practice. There is clearly no useful purpose in giving an antibiotic by mouth to a child who is repeatedly vomiting. Intramuscular administration of chloramphenicol is necessary in such cases until vomiting has abated, when the drug may be given by mouth.

(5) Collapse of the lung may occur either accompanying broncho-pneumonia or as a complication in itself. Persistent collapse leads to bronchi-

ectasis and it is fair to say that such a sequel should never happen in a well-conducted case. Radiological examination of cases of unresolved pneumonia or cases with persistent cough and/or pyrexia will practically always reveal areas of collapse. Skilled physiotherapy, including breathing exercises, percussion over the affected areas and postural drainage, brings about complete resolution within two to three weeks. Irreversible changes only occur in cases which remain untreated for six months or longer.

It is most important that respiratory complications should receive adequate treatment as soon as suspected; chemotherapy should be given in full dosage on a six-hourly basis; insufficient dosage favours the development of resistant strains of organisms.

Neurological complications are not common but are of serious prognostic import. Convulsions are the usual presenting feature and anoxia may be the precipitating factor. Prompt admission to hospital with administration of oxygen and barbiturates may curtail the attack and avert sequelæ. Severe cases prove fatal (Cockburn, 1961) or sequelæ in the form of hemiplegia or mental retardation may result. Steroids do not seem to have a place in treatment.

IMMUNIZATION

There can be little doubt that the modern pertussis vaccine is effective whether given alone or in combination with diphtheria and tetanus toxoids. The marked fall that has occurred in the mortality rate must be largely attributable to immunization and this must therefore be maintained. It is clear from Cockburn's (1961) analysis that infants in the first six months of life are the group especially at risk and various methods have been suggested for their protection. Administration of the vaccine at the first, fifth and ninth weeks of life has been successfully attempted but Cockburn's study showed that many of the infants who died in the first six months of life must have been infected when only a few weeks old and even early immunization would not have protected them. The suggestion by Kaufman and Bruyn (1960) that the safest and best method is adequate primary or booster immunization of siblings during the maternal gestation period has much to recommend it.

Strom (1960) has recently questioned the advisability of universal vaccination against pertussis. He reviews accounts of neurological complications after pertussis immunization. These were first reported from Denmark (Madsen, 1933) but assumed alarming proportions when Byers and Moll (1948) described 15 severe cases, two of whom died. In Sweden a nationwide investigation showed 36 cases in 215,000 immunized children (1 in 6000). Most of these took the form of convulsions, coma and collapse; there were four deaths and nine cases indicative of severe encephalopathy. Such findings suggest that encephalopathy is more common in Sweden than in other countries from which reports have been made or that the criteria of diagnosis were less strict. According to Cockburn (1959), slightly more

than a hundred cases of pertussis vaccine encephalopathy had been reported in twenty-five years in the world literature. Contrasting the risks of pertussis immunization with the risks of the disease itself he maintains that so long as the incidence of the disease remains high the risk of encephalopathy should not be considered a contraindication to immunization. Since the pathogenesis of neurological complications following both the disease and immunization is still unknown, further study of the problem should be made. Meanwhile, it should be understood that if one injection of pertussis vaccine causes symptoms in the central nervous system no more injections should be given. Also, children with a history of convulsions should not be given the vaccine and children suffering from other illnesses should not be immunized until they have fully recovered.

SUMMARY

(1) Although the incidence and mortality of whooping-cough have fallen the disease may still prove lethal, particularly in the first six months of life.

(2) Isolation of the organism from a per-nasal swab and characteristic changes in the white blood cell count afford valuable diagnostic criteria both in fulminant and in modified cases.

(3) Prompt and vigorous treatment of respiratory and neurological complications can save life; severe cases should preferably be treated in hospital where fully trained personnel and facilities for oxygen administration are readily available.

(4) Babies should be screened from infection by the immunization of as many children as possible. The immunization state of children in a family should be checked when the mother is pregnant. Reinforcing doses at school entry should be considered when there are siblings in the family.

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MUMPS

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MUMPS, or epidemic parotitis, is an acute specific infectious disease caused by a filterable virus having an affinity for glandular tissue, for salivary glands in particular and sometimes for the central nervous system.

ETIOLOGY

Johnson and Goodpasture (1934) first isolated the virus from saliva, inoculated it into the parotid ducts in the monkey and from there conveyed it to man by means of an oral spray. Kilham (1948) showed its presence in the blood. In 1942, Enders produced a skin sensitivity test using a filtrate from the parotid glands of infected monkeys (Enders and Cohen, 1942). He also introduced a complement-fixation test: a rising antibody titre indicates a current infection with the virus, even in the absence of clinical enlargement of the parotid glands.

Incidence.—Mumps is endemic in the British Isles with epidemics occurring in the early spring, whilst in the United States of America the incidence begins to rise in October reaching a maximum in midwinter.

Using the complement-fixation test it has been shown that 33 per cent. of young adults in the United States have considerable immunity to the disease without any history of the clinical condition. In the United States the attack rate of clinical mumps is 60 per cent., compared with 90 per cent. in measles (Brahdy and Scheffer, 1947).

It is sometimes said that clinical disease in only one parotid gland does not confer permanent immunity. This is not the case. Permanent immunity is conferred as much from unilateral as from bilateral clinical disease.

Age incidence.—Mumps is a disease of schoolchildren, and rarely occurs after 40. The preschool child is seldom affected. There is no difference in the sex incidence.

Incubation period.—The incubation period is usually of the order of 18 days. Some cases appear after an interval of three weeks. Very short or long periods point to the possibility of an undiagnosed or missed case.

Fatality rate.—The fatality rate from mumps is virtually nil. The rare causes of death due to the disease are meningo-encephalitis, pancreatitis and œdema of the glottis.

PATHOLOGY

The virus attacks mainly the interstitial tissue of the salivary glands. The saliva is of normal constitution, apart from a low diastase during the acute stage of the disease. From the 3rd to the 10th day there is a rise in the serum diastase in 96 per cent. of cases. According to Candel and Wheelock

(1946), the enzyme level is related to the parotitis and not the pancreatitis, but in my experience a sharp rise in the serum diastase occurs in pancreatitis. In orchitis or epididymitis, the pathological lesion is one of parenchymatous sclerosis sometimes with atrophy of the testis, whilst in meningo-encephalomyelitis the process is one of demyelination (Donohue, 1941; Arey, 1946). The white cell count shows a slight lymphocytosis, but when there is gross enlargement of the parotid glands or orchitis I have found a white cell count of 15,000 per c.mm. or more. The erythrocyte sedimentation rate is normal except in the presence of orchitis, when it is high. Candel and his colleagues (1944) consider that a raised erythrocyte sedimentation rate may give early warning of the onset of orchitis.

Henle and his colleagues (1948) describe two serologically different complement-fixation factors: V and S. The anti-S appears first but by the second and third weeks the two factors are equal, after which they fall. Finally after six months there is no anti-S, whilst the anti-V continues to be present and is linked with the permanent immunity in the patient.

Mumps in early pregnancy.—The paucity of recorded cases of congenital defects in infants argues against mumps being responsible for anything like the high incidence of congenital defects that occurs in the case of rubella.

CLINICAL COURSE

Although occasionally, and especially in children, the first sign of mumps is swelling of one or other parotid gland, there is usually a prodromal stage with malaise, pyrexia of 100° to 103° F. (37.8° to 39.5° C.), and a slightly sore throat without exudate, lasting from one to four days. During this stage two early signs may be elicited: (i) a slight redness and patulosity of the opening of Stenson's duct opposite the second upper molar tooth; (ii) if one runs one's fingers along the mandible and around the angle of the jaw, tenderness over the parotid will become apparent before any actual swelling occurs. As a rule one gland becomes swollen before the other, but both may come up simultaneously and be followed by enlargement of one of the submaxillary glands and less commonly the sublingual glands. The capsule may be stretched under pressure from the gland and cause much pain, with some degree of trismus and difficulty in mastication, whilst the surrounding œdema extending to the temples and, in severe maxillary gland involvement, to the sternum, may make the patient almost unrecognizable. The duration of the salivary gland enlargement is usually about seven to ten days, although on occasions it lasts as long as three weeks.

Incidence of manifestations.—As mumps is not a notifiable disease it is difficult to assess the frequency of its various manifestations.

Wesselhoeft (1951) recorded bilateral parotid swelling in 70 per cent. of cases, the submaxillary glands becoming involved in 10 per cent. or more and the sublingual glands occasionally. Orchitis occurred in 18 per cent. of males contracting the disease after puberty and oöphoritis in 5 per cent. of females after puberty. Meningo-encephalitis occurred in 10 per cent. of all cases.

Other glandular tissue such as the pancreas, breasts, thyroid, thymus and prostate as well as the organ of Corti, may become affected. Involvement of

any of these tissues may present with little or no clinical signs of salivary gland enlargement.

DIFFERENTIAL DIAGNOSIS

The diagnosis of bilateral mumps is usually fairly obvious. It is in unilateral mumps, or when only the submaxillary or sublingual glands are enlarged, that difficulty may occur. Careful routine examination of the throat will ensure that the bull neck of toxic diphtheria is not labelled mumps—with its tragic results. Apart from this the differential diagnosis lies mainly around the causes of enlarged salivary glands.

Pyogenic parotitis.—This is usually unilateral but may be bilateral and occurs when mouth hygiene is bad as in toxic fevers, e.g. typhoid, typhus and smallpox, coma from any cause and postoperatively.

Salivary duct calculus causing pain, tenderness and swelling of the affected salivary gland, especially at meal times.

Tumours which are unilateral, indurated and fail to resolve.

Mikulicz's syndrome: a chronic painless, progressive and symmetrical enlargement of all salivary and lacrimal glands with no fever.

Heerfordt's syndrome (uveo-parotid tuberculosis): a chronic condition of the uveal tract with parotitis, now considered to be sarcoidosis (Anderson, 1956).

Tonsillar and anterior cervical *lymphadenitis* should present no difficulty by reason of their situation, but a pre-auricular lymphadenitis situated over part of the parotid salivary gland may cause confusion. If there be not too much œdema, palpation of the anterior margin of the parotid and inspection of the opening of Stenson's duct in the mouth will assist.

The raised serum diastase in 96 per cent. of cases between the third and tenth day of the disease has led to the use of this investigation in parotid swellings of uncertain etiology.

Meningo-encephalitis due to mumps can be confirmed by growth of the virus from the cerebrospinal fluid even though it be absent from the saliva, and by a fourfold or more rise in the complement-fixation test *or* neutralizing antibody titre in paired sera, one taken as early as possible and the second ten to fourteen days thereafter (McMath *et al.*, 1956).

COMPLICATIONS

Orchitis and epididymo-orchitis.—Mumps orchitis is rare before puberty, although Wesselhoeft (1941) has recorded it in a baby aged 9 months, in a boy of 9 years and in another instance a boy of 11 years resulting in atrophy of the gonad. The frequency of this complication varies greatly in different epidemics and in a single epidemic, 25 per cent. is the average incidence of the complication in males after puberty.

Orchitis usually starts five to seven days after the mumps although it may be longer and is heralded by a sharp rise in temperature, general malaise, prostration, vomiting and headache. This is soon followed by pain and tenderness of the testis which rapidly enlarges to as much as six times its normal size with a secondary hydrocele of straw-coloured fluid. This fluid does not contain the virus but may be rich in mumps antibodies. The epididymis is often enlarged and tender. In the average case the testis resolves and becomes of normal size in seven to ten days. Swelling may

persist several weeks and atrophy may be apparent in six to eight weeks. Sterility after mumps is over-stressed: it may occur after severe bilateral orchitis which is infrequent. Patients should be reassured on this matter lest impotence of psychogenic origin develops. According to Werner (1950), who studied sperm counts, it cannot be regarded as an important cause of sterility in males, although it may be of subfertility.

Prostatitis.—This may not often be recognized, but it tends to occur after epididymo-orchitis, showing itself with raised temperature and backache. On rectal examination the prostate is enlarged, soft and tender.

Oöphoritis.—About 5 per cent. of women with mumps develop fever and a dragging pain and tenderness related to one or both ovaries. The next menstrual period may be delayed, but there is no subsequent sterility.

Mastitis may occur in either sex and may be painful, but resolves.

Pancreatitis.—Brahdy and Scheffer (1931), investigating 252 cases of mumps, discovered 13 instances of pancreatitis as a complication.

This suggests that many cases of mumps pancreatitis may be missed. This would not be surprising since the condition usually recovers spontaneously. The onset is with moderate fever, nausea, vomiting and epigastric pain. Seldom can an elongated tumour be felt. The fæces may contain unsplit fat globules and the urine may contain acetone. There may be glycosuria and a raised blood sugar. The white count is that of a lymphocytosis in contrast to a polymorphic response in a pyogenic pancreatitis. The serum diastase already raised in mumps, especially if bilateral, may show a brisk twentyfold rise in pancreatitis. Cole (1934, 1942) reported eight children who contracted severe diabetes mellitus shortly after mumps.

Other rarer complications are œdema of the glottis from severe submaxillary mumps, asymptomatic myocarditis diagnosed only by electrocardiography, and secondary infection of the gland causing abscess formation and sloughing of the facial nerve. Thrombopenia with or without purpura (Kolars and Spink, 1958) may be serious.

NERVOUS COMPLICATIONS

Quiescent mumps meningo-encephalomyelitis may occur without symptoms or signs other than a spike of temperature. The only change may be a lymphocytic pleocytosis found on routine lumbar puncture in a ward. Candel (1944) suggests that this form may have an incidence of 53 per cent.

Meningo-encephalomyelitis is said to occur in about 10 per cent. of cases of mumps. There are the usual physical signs of meningeal irritation with a lymphocytic pleocytosis and a raised protein in the cerebrospinal fluid. If mild, the condition subsides in a few days; on the other hand it may persist for several weeks and in rare instances may resemble the severe measles, chickenpox and post-vaccinal encephalomyelitis, with the perivascular demyelination found histologically in such diseases.

Cranial nerve paralysis.—Cranial nerves may be paralysed in mumps, but recovery is the rule. Polyneuritis may rarely complicate the disease.

Deafness.—The inner ear may be involved, with pyrexia, vertigo, tinnitus and a permanent and absolute stone deafness from involvement of the organ of Corti.

ATYPICAL MANIFESTATIONS

There has been discussion regarding the pathogenesis of mumps in that evidence has been produced supporting the thesis that it is a generalized blood-stream infection with localization in glandular tissue and the central nervous system. From this it is apparent that not only may the various complications follow the parotitis; on the contrary any of the former may be the presenting illness without any clinical signs of parotitis. To illustrate this it is well known that epididymo-orchitis or meningo-encephalitis not uncommonly occur out of the blue and from time to time pancreatitis, mastitis and subacute thyroiditis are the presenting malady. It is prudent that these conditions should be borne in mind during an epidemic of mumps.

TREATMENT

The patient should be put to rest in bed until the swelling of the glands has subsided. The pain can be relieved by soluble aspirin or by warmth applied to the swellings. On the other hand, cotton-wool may suffice. The hygiene of the mouth and the use of the toothbrush is of great importance. Many patients will be unable to masticate during the acute stage and so will be glad to drink adequate fluids through a straw or polythene tube, especially when the mouth is dry as a result of the diminution of secretions.

There is no known antibiotic to deal with mumps virus. It is therefore but wishful thinking to prescribe one. In the infrequent instance when there is a septic, non-viral focus in the mouth I would agree to the exhibition of such drugs and would favour tetracycline for five days along with vitamin B complex for seven days. 'Virugon' (N^1,N^1-anhydrobis-(β-hydroxyethyl) biguanide hydrochloride 100 mg., with atropine methonitrate 0.1 mg., and hyoscine methonitrate 0.1 mg.), two tablets thrice daily for seven to ten days, has been claimed to be of value, possibly due to an action on the virus-host cell although the exact mode of action is unknown. I am at present carrying out some trials with this drug.

When there is *orchitis* the scrotum should be supported by a suspensory bandage of suitable size or by a wad of cotton-wool or small pillow between the thighs. I have often used stilbœstrol, 2 mg. thrice daily, but have concluded that it is of doubtful value. In the case of severe and bilateral orchitis I usually prescribe steroids in the form of prednisolone, 40 mg. daily in divided doses, decreasing the following day to 30 mg. and to 5 mg. over about six days. I believe that this does assist the resolution of the inflammatory process although some physicians are dubious. I never prescribe steroids routinely but reserve them for the severe and bilateral disease which usually starts on the fifth to seventh day, by which time some immunity response has had time to develop. It should be noted in this connexion that steroids interfere with the immunity response and we have

no antibiotic for the mumps virus. Division of the tunica albuginea is occasionally practised, with a view to releasing the pressure on the essential cells of the testis, so relieving pain and preventing atrophy of the organ. I believe that this should be reserved for the very severe case not responding immediately to other measures, and must be carried out early—within thirty-six hours of the onset—to avoid pressure necrosis. I have found that local applications give no relief and that pethidine, 50 to 100 mg. repeated, may be necessary for the pain when compound codeine tablet B.P. fails.

In *meningo-encephalitis*, with increase in the cerebrospinal fluid pressure as high as 300 mm., the severe headache may be relieved by the very gradual release of fluid by lumbar puncture. This can be repeated if necessary in twelve to twenty-four hours. The remainder of the treatment for this condition is symptomatic, combined with good nursing of the patient. Change of posture while recumbent will ease the pain and spasm of muscles, as will local heat. Steroids may be tried in life-threatening cases.

PROPHYLAXIS

Infectivity.—Subclinical infection of the gland has been demonstrated by Henle and his colleagues (1948), who showed that patients may be infective two to six days before enlargement of the salivary glands, whilst Leymaster and Ward (1946) have isolated virus from a case six days after the onset of symptoms.

Henle and his colleagues (1948) took seven susceptible children and sprayed them with mumps virus. These children failed to develop the disease, but they produced mumps virus in their saliva and a rising antibody titre in the same time interval after exposure to infection as children who developed clinical mumps. Virus was isolated from the seven children for one to nine days longer than those developing clinical mumps.

It would appear that, apart from the clinical case of mumps, infection may be conveyed during the preclinical infectious stage and by subclinical cases with a more prolonged period of infectivity. I have no doubt that infection is kept up in a community by such subclinical and missed cases.

Mode of infection.—Mumps is spread by droplet infection of infected saliva and by infected fomites. Pharyngitis and tonsillitis without exudate in the prodromal stage might seem to give support to the mode of entry through the respiratory tract. On the other hand, Papp (1949), of Budapest, considers that, as in measles, the intact conjunctiva may be a portal of entry of mumps virus.

She transmitted mumps virus across the intact conjunctiva by swabbing the conjunctiva with infected material from the buccal mucous membrane of a patient in the first three days of the disease. Two positive results in ten trials were reported, but failure resulted in six cases out of six when infective mumps saliva was painted on the buccal mucous membrane and tonsils. Jovanović (1948) has shown in Yugoslavia that, following the introduction of mumps into a closed community, mumps convalescent serum, when instilled into the conjunctiva on the 13th and 19th day after the appearance of the first case and repeated after the first secondary case, would generally stop all succeeding cases and so terminate the outbreak.

Isolation.—It is probable that the close household contacts have already been infected before the swelling has been detected. Nevertheless, I would

always isolate such a patient until the swelling has subsided—i.e. for two weeks or until the swelling has gone down—because, although the disease is usually mild in children, they may infect adult males who, if susceptible, may develop severe orchitis. Orchitis and meningo-encephalitis may occur in the absence of clinical parotitis and Henle and his colleagues (1948) have shown that the saliva may be infected in these cases—hence the necessity for isolation.

Quarantine.—Quarantine should not be imposed upon contacts but they should be examined for early signs from the 12th to the 22nd day. Susceptible family contacts might be excluded from school during this period.

Disinfection.—All utensils, e.g. crockery, used by the patient should be boiled immediately after use. Other fomites such as handkerchiefs should be boiled. Ventilation of the room and a good spring clean will usually suffice on release of the patient.

Sero-prophylaxis.—Gamma globulin from pooled blood, although efficacious in the prevention of measles, has not sufficient antibodies to protect against either mumps, rubella or chickenpox. On the other hand, 20 ml. of gamma globulin prepared from mumps and rubella convalescent sera respectively can be of protective value if administered intramuscularly as early as possible, but not later than five days from the date of exposure. Generally speaking, gamma globulin or convalescent serum does not modify the course of a virus disease once the incubation period is over. Notwithstanding this, Gellis and his colleagues (1945) reported a 7.8 per cent. incidence of orchitis in cases of mumps treated with mumps convalescent gamma globulin, compared with 27.4 per cent. in those treated with normal pooled gamma globulin.

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MANAGEMENT OF ACUTE RENAL FAILURE AND INDICATIONS FOR THE USE OF THE ARTIFICIAL KIDNEY

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Until recently there has been some controversy as to the relative merits of a conservative medical regime and of the artificial kidney in the management of acute renal failure. In fact, such a conflict should not have arisen as all patients with acute renal failure should be treated in the first place conservatively and only in certain circumstances should dialysis with the artificial kidney become necessary. The value of the artificial kidney is now established and the indications for its use more precisely defined.

The development of the artificial kidney, and of other similar methods depending upon extracorporeal circulation, is dependent upon two important factors: (a) the prevention of coagulation of the blood within the new circuit; (b) the presence of a uniformly selective dialysing membrane. Abel, Rowntree and Turner (1914) initially devised a method by which blood of a living animal could be submitted to dialysis outside the body and subsequently returned to the circulation without exposure to air, infection by micro-organisms or any other factor prejudicial to life. Coagulation of the blood was prevented by crushing the heads of a large number of leeches and using the purified extract. During the 1939-45 War, Kolff (1947) constructed an artificial kidney which can be said to be the first to achieve clinical success. This rotating drum type of machine has been modified by Merrill (1955) in the United States and by Parsons (Parsons and McCracken, 1959) in Leeds. Alwall (1947) and Skeggs and Leonards (1948) have devised similar types of dialysers but differing in principle and construction from the Kolff apparatus in that they are capable of ultrafiltration as well as dialysis. More recently, Kolff has developed a twin-coil disposable artificial kidney which is being widely used.

THE SKEGGS-LEONARDS-HEISLER ARTIFICIAL KIDNEY

At the Liverpool regional renal insufficiency unit we have used the Skeggs-Leonards-Heisler artificial kidney.

In preparation for dialysis, two dialyser packs are assembled with 'dupont' P.T. 300 cellophane that has been boiled just previously for one hour and thoroughly rinsed. Each pack consists of twelve units providing approximately 20,000 sq. cm. of dialysing surface. One of the packs is assembled on the cabinet (fig. 1) and disposable polyvinyl tubing is used to complete the circuit containing blood. The rubber used in the 'boot' of the pump is the only rubber with which blood comes

in contact in this circuit. The circuit containing the dialysing fluid is completed with tygon tubing. Each of the twelve units in the pack consists of two rubber pads between which are two layers of cellophane. Blood flows in one direction between the two layers of cellophane, and the dialysing fluid flows in the opposite direction, on each side, between the rubber and the cellophane.

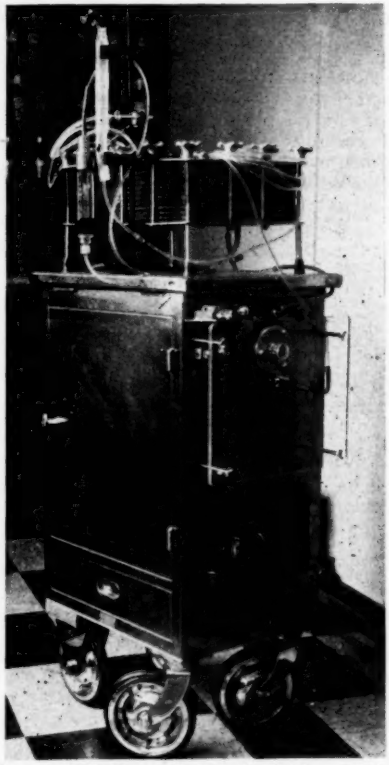

FIG. 1.—The Skeggs-Leonards-Heisler artificial kidney.

The completed path for the blood (fig. 2) is then sterilized chemically with a 0.4 per cent. solution of formaldehyde. A dialysing unit so prepared is always ready for immediate use, and, when hæmodialysis is about to be performed, the circuit for the blood is washed by pumping through it twelve pints (7 litres) of a sterile solution of isotonic sterile sodium chloride. The circuit for the dialysing fluid is washed by pumping through it at the same time 50 litres of a freshly prepared isotonic solution of sodium chloride: this solution need not be sterile. Final preparation for dialysis is completed by pumping the dialysing solution through one circuit and filling the dialyser under a moderate pressure with 450 to 500 ml. of properly cross-matched donor blood.

The dialysing solution contains 235 mg. of dextrose per 100 ml., and the following substances in milliequivalents per litre: sodium 140; potassium 4; calcium 5.1; magnesium 2; chloride 111; phosphate 1; bicarbonate 33.4; and lactate 7.9.

In our opinion this type of machine has the following advantages:—

(1) There is a continuous flow, blood and dialysing fluid flowing in opposite directions for the full six hours of the dialysis; it is not necessary to stop the dialysis to change the fluid as in the Kolff machine.

(2) The pressure differential between the blood and the dialysing fluid circuit effects ultrafiltration of fluid from the corporeal circulation. This is especially useful when there has been overhydration, and when blood transfusion is required it can be given more safely during the dialysis.

(3) It is cheaper to maintain and, once it has been set up and organized, the replacement of new packs costs little but takes a little time and trouble in the preparation. The packs are prepared in the department.

(4) There is not the excessive movement and turbulence which necessarily occurs when using the Kolff rotating drum and which tends to damage the red blood corpuscles. McLean (1952) has pointed out that some degree of hæmolysis is commonly noted in samples of blood subjected to the rotation of the drum.

(5) Only one pint (570 ml.) of blood is required to prime the dialysing unit.

We do not, however, believe that the type of artificial kidney used is as important as ensuring a steady flow of patients with renal insufficiency

dealt with by a small group of clinicians and nurses interested in and experienced in this particular problem.

INDICATIONS

The principal indication for the use of the artificial kidney is acute reversible renal failure, the causes of which can be summarized as follows:—

(1) Obstetrical: accidental hæmorrhage, abortion.
(2) Medical: acute glomerulonephritis, acute pyelonephritis, acute gastroenteritis.
(3) Traumatic: multiple injuries, severe operations, crush syndrome.
(4) Acute hæmolysis: incompatible blood transfusions.
(5) Nephrotoxic agents: carbon tetrachloride, mercury.
(6) Obstructive uropathy: sulphonamide crystalluria.

The need for dialysis in any patient with acute renal failure is assessed

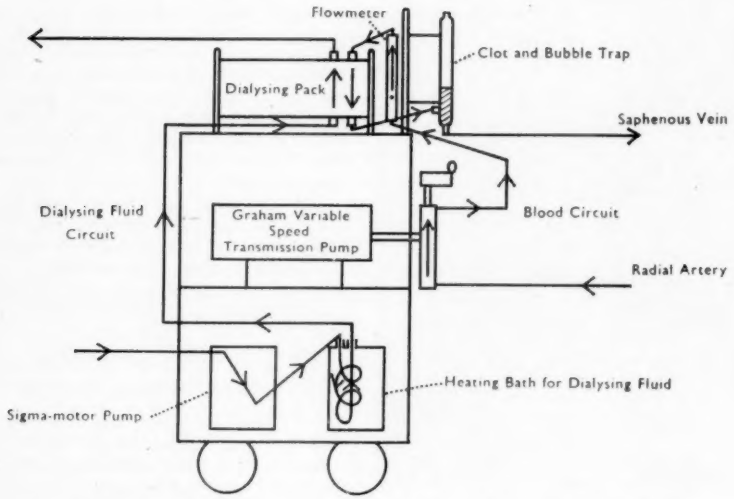

FIG. 2.—Schematic representation of the Skeggs-Leonards-Heisler artificial kidney.

in the light of his clinical and biochemical progress on the basic regime described below.

Clinical indications include:—

(a) Persistent nausea or vomiting
(b) Increasing drowsiness
(c) Mental confusion

Biochemical changes indicating dialysis include:—

(a) Blood urea greater than 400 mg. per 100 ml.
(b) Potassium greater than 7 mEq./litre (with electrocardiographic evidence suggestive or definitive of hyperkalæmia)
(c) Alkali reserve less than 13 mEq./litre

BASIC REGIME

All patients admitted to the unit are managed on a basic regime which is continued throughout the period of oliguria and diuresis.

(1) Accurate recordings of :—

(a) Fluid intake

(b) Fluid loss: (i) Urine output (avoiding urethral catheterization if possible)

(ii) Vomitus

(iii) Fæcal loss in diarrhœa

(iv) Aspiration and drainage.

(2) Daily estimations of blood urea, electrolytes and alkali reserve levels with serial electrocardiograms when the blood potassium level is changing.

(3) Daily or more frequent clinical observation.

(4) Limitation of fluid intake by all routes to 500 ml./24 hours in excess of any loss during the previous twenty-four hours.

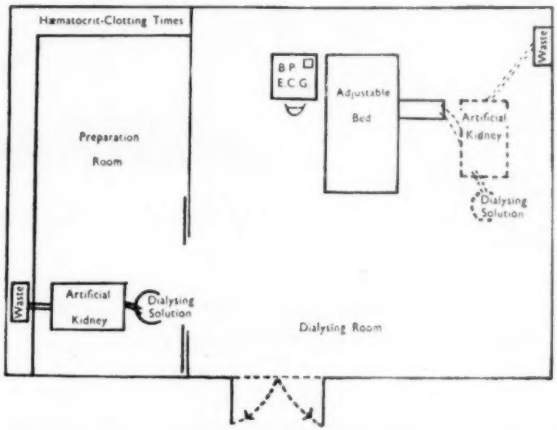

FIG. 3.—Artificial kidney unit. The patient is brought from the ward into the dialysing room where cannulation is performed. The artificial kidney is prepared in an adjoining room and when cannulation is completed the machine is connected to the patient.

(5) A non-protein diet:—

(a) 15 per cent. lactose solution, or

(b) Boiled rice, bread and butter when tolerated. Fruit and fruit juices are avoided because of their high potassium content.

(6) Norethandrolone, 10 mg. thrice daily orally, or 25 to 50 mg. intramuscularly daily, has been shown by McCracken and Parsons (1958) to lessen the rate of protein breakdown in acute renal failure.

(7) Daily injections of a high-potency vitamin preparation until the patient is able to take a normal diet.

(8) Ion-exchange resins (e.g. sodium polystyrene sulphonate) may be needed to reduce a high blood potassium.

PROCEDURE OF DIALYSIS

The dialysis, which is carried out in a special room (fig. 3), is continued for six hours but the whole procedure, including cannulation and decannulation, takes about nine hours. The most suitable sites for cannulation are the radial artery for the supply to the blood pump, and the median cubital vein for the return from the dialyser. Heparinization is maintained at a level

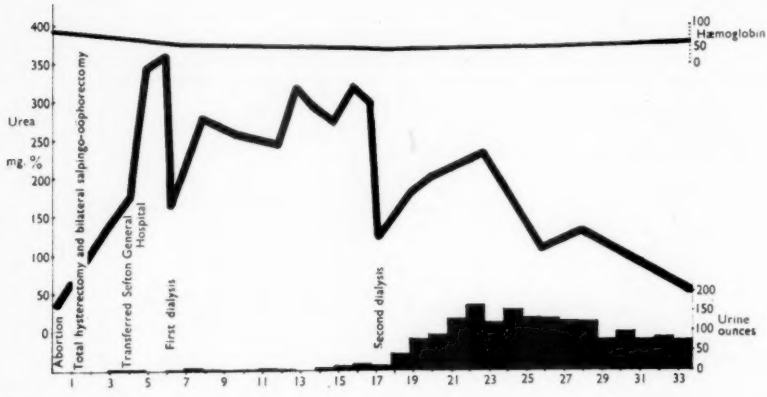

FIG. 4.—Chart showing course of case of acute obstetrical renal failure treated by the artificial kidney.

sufficient to prolong the blood coagulation time to thirty to fifty minutes during the major portion of the procedure.

RESULTS

Clinical results.—After the initiation of hæmodialysis, cardiac irregularity due to potassium intoxication is usually corrected within thirty minutes and acidotic breathing within three to four hours. Uræmic twitching and mental confusion may be aggravated during the dialysis, sometimes sufficiently to require control by deep sedation. Clinical improvement is most noticeable twenty-four to forty-eight hours following the dialysis and is usually maintained for several days, even with continuing oliguria.

Biochemical results.—In order to achieve successful hæmodialysis it is necessary to produce the following biochemical adjustments in the plasma composition of the patient.

(1) Reduction of blood levels of urea and creatinine to 50 per cent. or less of their predialysis values (a urea clearance of 65 per cent. is not uncommon with the Skeggs-Leonards-Heisler machine).

(2) Reduction of plasma potassium concentrations (when hyperkalæmia exists) to values within the normal range and preferably to approximately 3.5 to 4.0 mEq./litre.

(3) Stabilization of plasma bicarbonate levels at approximately 20 mEq./litre when the initial values are materially lower than this.

(4) Adjustment of sodium, chloride and calcium to approximately low normal values.

TWO CASE REPORTS

Example of acute obstetrical renal failure

Mrs. M. (*aged* 26) (fig. 4).—After three normal deliveries, abortion was induced in the fourth pregnancy. Whatever agent was responsible, it not only produced a

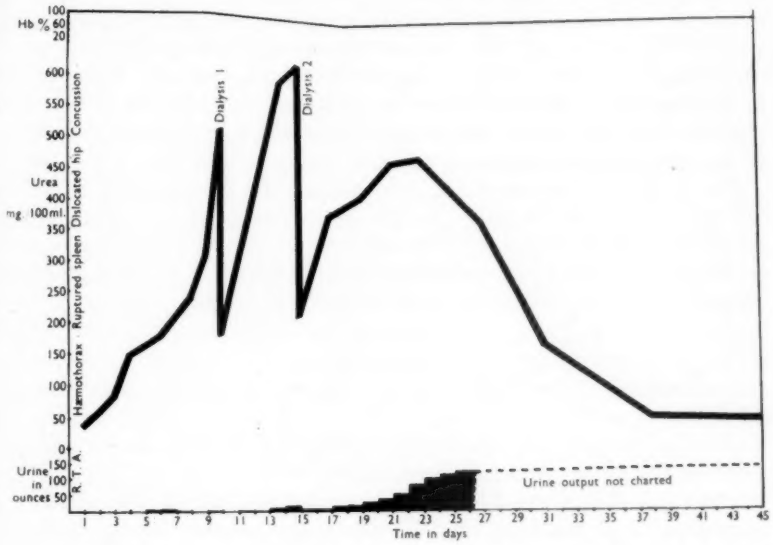

FIG. 5.—Chart showing course of case of acute traumatic renal failure treated by the artificial kidney.

collapsed state of the patient but also necessitated an emergency laparotomy. The uterus, tubes and both ovaries were found to be hæmorrhagic and necrotic and a total hysterectomy and bilateral salpingo-oöphorectomy had to be carried out. Two pints (1 litre) of cross-matched compatible blood were transfused during the procedure. Acute suppression of urine followed.

Example of acute traumatic renal failure

Mr. W. (*aged* 18) (fig. 5).—Involved in a motor-cycle accident in which he sustained fractured ribs with a left-sided hæmothorax, fractured left superior and inferior ramus of the pelvis, dislocation of the right hip and a ruptured spleen. The patient was severely shocked and the injuries were dealt with by an underwater seal drainage of the left chest, reduction of dislocated hip and splenectomy. Acute renal suppression followed.

DISCUSSION

As has already been noted, the principal use of the artificial kidney is in

acute reversible renal failure, especially when a sudden incident has caused acute urinary suppression in a patient with previously normal kidneys. It now becomes possible to 'tide over' a great number of these cases with the aid of extracorporeal hæmodialysis until renal function is recovered. In such patients it is to be expected that the majority will be discharged from hospital with apparently normal renal function. The fact that many of these patients are under the age of forty, e.g. the obstetrical group of renal failure, emphasizes the importance of this advance in therapy.

The place of hæmodialysis in cases of irreversible chronic renal failure is not so definite. It is certainly possible to correct any sudden biochemical crisis which may occur, but it is not possible to restore renal function to permanently damaged kidneys. The future of this type of case lies in the development of renal transplantation, and here the artificial kidney will play an important role in covering the patient during the period of 'take' of the donor renal transplant.

The artificial kidney has also been used in the treatment of poisoning due to salicylates and barbiturates. In cases of barbiturate poisoning which have failed to respond to the usual therapy, and in which the responsible barbiturate is freely dialysable and not firmly bound to the plasma proteins, hæmodialysis has produced dramatic improvement.

CONCLUSIONS

(1) The use of the artificial kidney and its indications in acute renal failure are now firmly established.

(2) The Skeggs-Leonards-Heisler machine has a number of advantages over the Kolff rotating drum apparatus.

(3) Approximately half the patients with renal failure referred to the renal insufficiency unit required dialysis on one or more occasions.

(4) Like other observers, we have noted the higher mortality in the group of patients in which renal failure follows some surgical condition.

(5) In certain patients dialysis is a life-saving procedure.

(6) We believe that patients with acute renal failure benefit by early transfer to a unit with facilities for hæmodialysis. This is especially true of patients in the surgical and traumatic group in which the accumulation of urea and toxic metabolites is much more rapid.

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MANIPULATION IN LUMBAR INTERVERTEBRAL DISC LESIONS

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LESIONS of the lumbar intervertebral discs are a major cause of lumbar back pain, with or without sciatica, but such lesions are by no means the only cause of pain in the lumbar region, as is sometimes somewhat uncritically assumed. The preliminary general examination of the whole patient including x-ray examination of the lumbar spine and the pelvis, is essential. For instance carcinoma of the prostate, primary or secondary neoplasms of the spine, and tuberculosis are among conditions which must be excluded. A rectal, and in women a vaginal, examination should never be omitted.

There are many common causes of lower back pain, which are often confused with prolapse of the lumbar intervertebral discs: e.g. muscular and ligamentous sprains and strains, muscular rheumatism (or fibrositis), sacro-iliac strain or subluxation, chronic lumbo-sacral strain, osteoarthritis, ankylosing spondylitis, congenital abnormalities and cases of functional origin. Many of these cases of pain in the lumbar region benefit greatly from manipulative treatment. This is particularly the case in many patients with neglected lower back strain, whether lumbo-sacral or sacro-iliac. In lumbo-sacral strain early active movements usually prevent the formation of scar tissue. If scar tissue has developed and is causing painful limitation of movement of the lower back, it should be broken down or stretched by manipulation at the earliest possible moment. One sees too many cases in which the patient has been converted into a chronic invalid by immobilizing the lower back by a rigid support or a corset reinforced with metal or a Taylor's brace. At Tribunals dealing with industrial injuries and war pensioners one sees a large number of chronic painful backs. Movements of the lower back are usually very painful and restricted and this is not surprising because they are nearly always encased in rigid spinal jackets. Most of these pensioners have been drawing disability pensions for many years and the question of putting them on their feet again by manipulating their backs and following this up with exercises seldom seems even to have been considered.

THE SURGICAL ANATOMY OF INTERVERTEBRAL DISCS

The intervertebral discs constitute between one-quarter and one-fifth of the total length of the spine, being thicker in the more mobile cervical and lumbar regions. By their shape the discs are largely responsible for the formation of the secondary curves of the spine. In old age the discs degenerate and the secondary curves tend to disappear.

In the lumbar region the forward convexity is largely due to the fact that in this region the discs are thicker in front than behind. In this region the nucleus of the disc forms about one-quarter of its total volume. The discs act as shock absorbers, each with a central elastic nucleus pulposus and a peripheral portion of concentric fibres. Separating the disc from the vertebral bodies above and below is a cartilaginous plate. The disc nucleus has a high water content and is incompressible but can alter its shape under pressure. It has been estimated that the water content of the nucleus at birth is 88 per cent. Thereafter it slowly decreases until in the seventies it may be 70 per cent. When the disc nucleus has become prolapsed it soon loses a substantial amount of its water content.

It is important to realize that herniation of the disc nucleus is preceded by degenerative changes in the latter and in the posterior part of the annulus. Thus, an injury may trigger off the herniation of the nucleus by rupturing the already degenerate posterior portion of the annulus. In many cases, particularly in older persons, there is no history of injury and the disc lesion or lesions may or may not be part of an arthritic process. What causes the degeneration of the disc is not known but it may be connected with the fact that the discs contain no blood vessels. The same degeneration may be found in articular cartilage in osteoarthritis and here also no blood vessels have been traced in this structure except at the extreme peripheral margins.

The relationship of the discs to the spinal canal which lies behind is important.

The spinal cord ends at the level of L1 but the spinal theca extends as far as S2, and is occupied by the cauda equina or spinal nerve roots. These nerve roots emerge from the spinal canal through the intervertebral foramina which in the lumbar region diminish in size from above downwards, whereas the corresponding nerve roots increase in size from above downwards. Thus the largest 5th lumbar nerve roots emerge through the smallest intervertebral foramina. The surgical anatomy of the intervertebral foramen should be particularly noted. Anteriorly lie the posterior surfaces of the bodies of adjacent lumbar vertebræ and the posterior surface of the intervertebral disc covered by the posterior longitudinal ligament. Posteriorly is the joint between the articular processes of the lumbar vertebræ and above and below are the vertebral laminæ.

CLINICAL FEATURES OF LUMBAR DISC LESIONS

These lesions most commonly affect the disc between L5 and S1, but are also common between L4 and L5. They are relatively uncommon in the higher lumbar zone.

Armstrong's (1958) figures in a series of 1000 consecutive cases in which the findings were confirmed at operation were:

L5 to S1 disc lesions	468 (46.8 per cent.)
L4 to L5 disc lesions	404 (40.4 per cent.)
L1, L2, L3 disc lesions	21 (2.1 per cent.)
Double lesions	107 (10.7 per cent.)

In the most common type of case, such as a typical industrial injury, the onset is sudden and often occurs during an acute flexion-strain of the lower back as, for example, in stooping to lift a heavy object. There is acute pain in the lumbar region often referred to one or other lower extremity although

the onset of the latter may be delayed for a variable period or in rare cases may not occur.

In many cases there is a history of intermittent attacks of low back pain before the onset of the more acute symptoms and during this period it is probable that degeneration of the disc nucleus and of the posterior portion of the annulus is taking place. A sudden injury or strain causes the posterior part of the annulus to rupture so that the nucleus slips through the gap in the annulus and becomes nipped between the posterior borders of the adjacent lumbar vertebræ usually L4 and L5, or L5 and S1. In about 60 per cent. of cases there is a history of some specific injury before the onset of symptoms.

Clinically, there is a board-like rigidity of the erector spinæ muscles with obliteration of the normal forward convexity (lordosis) of the lumbar spine. Lumbar scoliosis often exists with its convexity as a rule towards the side of the lesion. The actual type of the functional scoliosis depends upon the relation of the spinal nerve root to the prolapse. If it lies to the inner side of the prolapse the scoliosis is usually with its concavity to the affected side. Sometimes the scoliosis is alternating. When pain is felt in the lower extremity straight leg-raising is restricted on the affected side. The neurological phenomena are usually more marked in one lower extremity than in its fellow because the protrusion of the disc nucleus is rarely central and usually pressure is exerted in the region of the intervertebral foramen.

X-ray examination is essential, to exclude other conditions, but is not usually diagnostically helpful as regards the disc in the early stages. Diminution of the disc space in traumatic cases uncomplicated by arthritis is unusual except in cases of massive protrusion and in late cases in which the disc has undergone degeneration. When this has occurred secondary osteoarthritis often coexists with typical lipping of the edges of the lumbar vertebral bodies.

Myelography.—As it is usually possible to diagnose the level of the disc lesion by clinical examination myelography is of somewhat theoretical interest. It is often valuable, however, in the differential diagnosis between a prolapsed disc and an intramedullary spinal tumour.

In some types of disc lesion, particularly in the early stages, the annulus is torn and the torn portion slips in and out causing symptoms of recurrent derangement of the spine without at first any signs of nerve pressure. Patients complain of locking of the back, usually of a temporary nature, which they have often learned how to rectify as in many cases of recurrent displacement of the torn semilunar cartilage in the knee-joint. In more serious cases, herniation of the nucleus pulposus of the intervertebral disc occurs. This herniation is extra-thecal and often bulges into the dural canal and often, but not invariably, presses upon spinal nerve roots in the region of one or other intervertebral foramen.

Disturbances of sensation due to pressure upon the sensory elements of

the spinal nerve roots often occur, the commonest of which is sciatica. The motor fibres may also be involved causing such symptoms as limitation of dorsi-flexion or plantar flexion of the foot on the affected side and muscular wasting. A knowledge of the spinal dermatomes and myotomes is thus essential. For instance in a prolapsed disc affecting L_5 and S_1 pain is usually felt in the posterior aspect of the leg below the knee and in the sole of the foot. This may be deep pain felt in the myotome supplied by the 1st sacral root or more superficial due to pressure and root irritation in the dermatome supplied by the same root. Diminution of, or even absence of, the ankle-jerk is a common feature in these cases.

TREATMENT OF THE ACUTE CASE

The prolapse should be made to retrace its steps at the earliest possible moment. Bed rest with traction should be tried first; fracture boards are advisable. In my experience the most effective form of traction is the Camp-Varco apparatus in which weight extension is applied through a pelvic belt and therefore acts more directly upon the lumbar spine than is the case in most other methods of extension. Counter-traction is obtained by lifting the foot of the bed 8 to 12 inches (20 to 30 cm.).

Too much time should not be spent in attempting to reduce the prolapse by traction. If no improvement in the acute symptoms can be registered after 2 weeks manipulation combined with traction should be performed, preferably under some such anæsthetic as thiopentone. Some surgeons have acquired great skill in reducing the prolapse by manipulation without anæsthesia and often in stages, but the great advantage of anæsthesia is that, if skilfully administered, it brings about the perfect muscular relaxation which is essential for satisfactory reduction. Manipulations performed without anæsthesia must perforce be painful. This results in reflex muscular spasm which militates against successful reduction. Sir James Paget (1867) advised the profession to imitate what is good in the practice of bonesetters and it is interesting in this connexion to remember that the famous bonesetter, Sir Herbert Barker, usually performed his manipulations under anæsthesia. It is sometimes argued that it is safer to dispense with an anæsthetic as the patient's reactions are a valuable guide to the manipulation. This is often the case in manipulations for cervical disc displacements but in the lumbar region this objection is largely theoretical.

The acid test of reduction of the prolapsed disc is that the normal lumbar curve is restored and that full extension is no longer acutely painful. There is usually an immediate marked improvement in back pain and in the referred sciatic pain. In fact, the relief is reminiscent of that seen when a displaced semilunar cartilage in the knee is reduced. A certain degree of discomfort may last for a few days and is treated by infra-red irradiation and massage.

Unfortunately it is often wrongly assumed after a period of bed rest,

with or without traction, that the protrusion has been reduced, and a common practice is to immobilize the lumbar spine in extension in a plaster jacket. This is a procedure which may be followed by disastrous results and similar disaster may follow the common practice of immobilizing the lumbar spine in a plaster jacket when the protrusion remains unreduced. The complete immobilization by the plaster jacket when the protrusion is unreduced causes wasting of the back muscles, and adhesions form between the disc protrusion and the surrounding structures including the nerve root, the dura and the posterior longitudinal ligament. This makes the ultimate reduction still more difficult and may require an operation to remove the protruded portion of the nucleus and often a difficult freeing by dissection of the adherent nerve root. In my experience, the nerve root rarely completely recovers from this chapter of accidents and sciatica may persist indefinitely.

When reduction has occurred, either by simple bed rest, traction, or manipulation some strong support is required to keep the lumbar spine hyperextended—a position which, as it were, locks the door, the bursting open of which caused the disc protrusion. Although a plaster jacket is often used for this purpose some less rigid type of support is preferable, such as a strong canvas corset with bone, but not metal, supports. It is important to start special exercises immediately to build up the strength of the erector spinæ and other muscles which bring about extension of the back.

If treatment of the early acute case is carried out in the manner indicated the number of chronic cases which swamp outpatient departments, and which are such a heavy burden to the taxpayer in compensation, would be greatly diminished.

THE TREATMENT OF THE CHRONIC CASE

Before discussing the treatment of the chronic case I propose to describe a typical case such as those who sit upon tribunals dealing with industrial and war injuries see all too often. An industrial worker falls from a ladder and injures his back.

(1) Often seen first of all by the industrial medical officer who renders first aid. In the absence of paralysis or other severe signs and symptoms he is taken by ambulance to his home.

(2) He is then seen by his N.H.S. doctor, ordered rest in bed and kept under observation.

(3) After two or three weeks' rest in bed, the pain in the back, with or without referred sciatic pain, not having improved he is referred to the orthopædic department of the nearest hospital.

(4) There he is examined, the spine is x-rayed, and a 'lumbar disc lesion' is diagnosed.

(5) Bed rest is continued, with weight extension, and fracture boards.

(6) Still no improvement, so a plaster of Paris jacket is applied. During this period the prolapsed nucleus becomes steadily more and more fixed in its abnormal situation.

(7) The plaster jacket is worn for one to two months. The patient usually finds

it well-nigh intolerable but the actual acute pain in the back and/or sciatic region due to the disc may be relieved while the jacket is worn.

(8) The plaster jacket is removed and the patient is transferred to the physical medicine department, where exercises, particularly extension of the spine, are started. Flexion exercises for the lower back are excluded, and a rigid corset of leather or canvas containing metal supports is worn to maintain extension of the lumbar region and prevent any flexion of the lower back. This is followed by temporary improvement, but movements of the lumbar spine are still painful and restricted.

(9) He returns to work, having improved with physical treatment and extension exercises but movements of the lumbar spine are still somewhat painful and restricted. After a short time at work pain, both in the lower back and the sciatic zone, becomes more marked.

(10) He returns to hospital; exercises are stopped and a fresh plaster jacket applied.

(11) Repetition of previous sequence of events.

(12) At this stage laminectomy with removal of protruded nucleus is often performed, with only temporary benefit.

It will be noticed that during this long history no mention has been made of manipulation and this unfortunately is indeed too often the case in the histories that come to hand.

In such chronic cases of lumbar disc lesions manipulation under anæsthesia is to be strongly recommended because the chronicity of the symptoms is due to the fact that there is a persistent protrusion of the disc nucleus, complicated by the presence of adhesions. The lumbar spine is in fact locked and there is associated nerve-root pressure, and the unlocking by manipulation and the resulting relief of nerve pressure results in breaking a vicious circle in a high percentage of these cases. It is often stated that manipulation in such cases is risky because it may bring about a massive protrusion of the nucleus which may cause serious symptoms such as paraplegia or incontinence of urine.

Personally, in a large experience, I have not encountered such untoward results of manipulation, which suggests that they must be extremely rare. On the other hand, it is wise to refrain from manipulation when there are signs of pressure on the 4th sacral root, including bladder symptoms and a saddle type of anæsthesia. Another contraindication to manipulation is the rare case of massive disc protrusion coming on suddenly after a serious type of injury and associated with paraplegia. In such cases laminectomy is urgently necessary to release the pressure upon the cauda equina.

The practice of wearing a plaster jacket is a major cause of the painful limitation of flexion of the lumbar spine which is an almost invariable sequel of both reduced and unreduced cases when the plaster jacket has been worn. Most patients find a plaster jacket extremely uncomfortable and heave a deep sigh of relief when it is discarded. The advantage of the stout canvas corset is that it can be removed for re-educational extension exercises and that therefore there is less risk of wasting of the back muscles and of troublesome adhesions between the prolapsed nucleus and surrounding structures.

A large number of lumbar disc lesions are seen at Medical and Pensions

Appeal Tribunals and nearly all these patients present the feature of painful limitation of flexion of the lumbar spine, a condition which has to be seriously taken into account when assessing the total disability. This painful limitation of flexion is, I consider, due to preoccupation with building up the spinal extensors and neglecting the other movements of the lumbar spine. It can nearly always be noted after laminectomy.

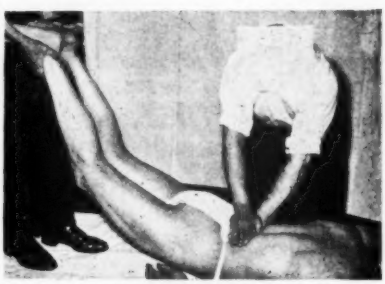
(a) First movement—commencement of flexion.

(b) Second movement—by lifting the pelvis the operator imparts further flexion to lumbar and lower dorsal spine.

(c) Third movement—rotation of pelvis and lumbar spine.

(d) Fourth movement—the 'pelvic twist'.

(e) Fifth movement—extension combined with traction.



(f) A more effective method of traction and extension than that shown in (e).

FIG. 1.—Technique of manipulation for prolapsed intervertebral disc (lumbar).

TECHNIQUE OF MANIPULATION

The technique of manipulation is shown in figures 1 and 2.

It is preferable to have the patient lying upon a low couch or a hard mattress on the floor. Intravenous thiopentone is an admirable form of anæsthesia, as perfect muscular relaxation is a *sine qua non*.

As soon as the patient, lying supine, is completely relaxed the movement of flexion of the lumbar spine is first performed by flexing the thighs fully upon the abdomen

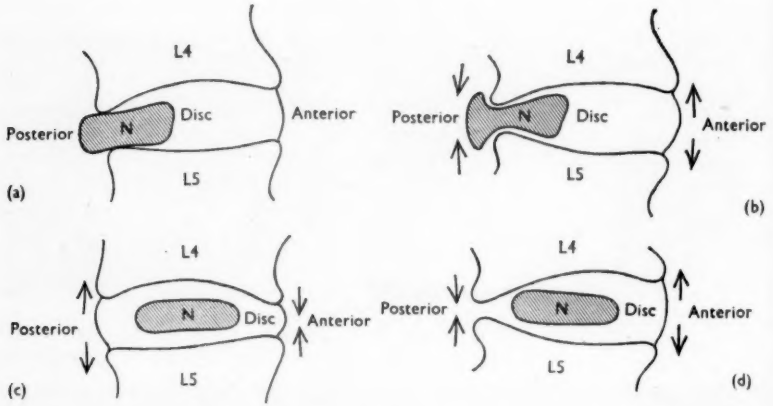


FIG. 2.—(a) Partial prolapse backwards of nucleus (N) of intervertebral disc between L_4 and L_5. The posterior portion of the nucleus is firmly gripped by the posterior borders of the corresponding lumbar vertebræ. (b) A common error in manipulation for prolapsed lumbar disc. With the patient in the prone position the lumbar spine is first forcibly extended. This has the effect of increasing the grip of the posterior borders of the lumbar bodies upon the prolapsed portion or may break it away so that it constitutes a loose body in the spinal canal. The movement of extension is very important but must follow and not precede reduction of the prolapsed nucleus. (c) Preliminary flexion of the lumbar spine has released the grip upon the prolapsed nucleus and has enabled it to recede into the intervertebral area. (d) In the final movement the lumbar spine is now forcibly extended, thus closing the door through which the nucleus escaped. (*Note*.—Although in these illustrations the prolapsed portion of the disc is the nucleus, in many cases the prolapsed portion is formed of the annulus. The same manipulative techniques apply in this type also.)

and then using a pelvic grip to increase still farther the flexion of the lumbar spine. This opens the space between the lumbar vertebræ on either side of the affected disc and releases the grip of the posterior borders of these bodies on the protruded disc (fig. 2). Rotation is then performed on the lumbar spine while flexed, again using the grip on the pelvis. The 'pelvic twist' is usually added as this brings about maximum rotation of the lumbar vertebræ. These rotatory movements break down any adhesions between the prolapsed disc and the posterior common ligament or spinal nerve root, and the flexion opens up the space between the vertebræ and allows the prolapsed portion to slip back.

The final movement is very important. The patient is turned over into the prone position and traction and extension of the lumbar spine are exerted. In this movement there is approximation of the posterior borders of the affected lumbar vertebræ and the door is thus firmly closed.

After the manipulation a strong corset must be worn to maintain the

normal lumbar curve and militate against any further prolapse, and extension exercises for the lumbar region are practised assiduously. Recurrence of symptoms is rare if this treatment is followed faithfully and if it occurs this is an indication for further manipulation rather than laminectomy.

RESULTS OF MANIPULATION

The results depend upon careful selection of cases and upon the skill and experience of the manipulator. A common, in fact almost universal, error is the use of excessive force and I find that beginners almost invariably err in this respect. A delicacy and sensitiveness of touch are necessary and these are inborn qualities which, however, can be further developed by training and continuous practice. Technique is of far greater importance than brute force. In fact, I strongly suspect that many of the 'sad examples' regularly brought forward by opponents of manipulation are due to the lack of the necessary qualities in the operator and to the use of brute force.

With these reservations a high percentage of successful results should follow manipulation for lumbar disc lesions. The results in many cases are brilliant and dramatic and usually lasting; even when they are not quite so brilliant as this a high percentage derive marked benefit and their lives are made more tolerable.

In my own series I have never personally encountered increase of symptoms following manipulation of the lumbar spine but one of my medical patients remained *in statu quo* and subsequently his sciatica was cured by laminectomy.

In this case, in spite of a confident diagnosis of disc prolapse by neurologist and neurosurgeon, operation showed that a tight band of adhesions was constricting the spinal nerve root. This was divided with subsequent relief but no actual prolapse was seen.

LAMINECTOMY

The long-term results of this operation have not come up to expectations; it does little to relieve the backache, and relief of sciatic symptoms is often of a temporary nature only. In my opinion laminectomy should never be performed for a prolapsed disc unless a previous trial has been made of traction and manipulation under anæsthesia. It sometimes happens that after manipulation a temporary improvement is followed by recurrence of symptoms due to prolapse of a further portion of the degenerate nucleus. In such cases before laminectomy is seriously considered the manipulation should be repeated and this is usually followed by a further, possibly long, period of improvement. It is a very different story when symptoms recur after laminectomy, as a second operation at the site of the previous laminectomy is a serious and difficult major operation owing to the presence of dense scar tissue.

Recently I saw a patient suffering from a prolapsed lumbar disc who in a period of five years had two laminectomies and a spinal fusion performed. Manipulation had never been considered.

From my own experience of a large series of well-documented operation cases I should put the failures at far higher than the admittedly high figure of 21 per cent. quoted by Armstrong (1958). Indeed, I would go even farther and state that from an examination of the large number of well-documented cases of laminectomy for disc protrusion that have passed through my hands complete cure is rare when the assessment is based upon a two to three years' postoperative follow-up.

SUMMARY

Manipulation is a valuable measure in the majority of cases of chronic low back pain, including that due to a prolapsed intervertebral disc, provided such conditions as pelvic or spinal tumours and tuberculosis have been excluded by careful examination. In a minority of disc cases laminectomy rather than manipulation is indicated.

Large numbers of chronic painful backs are due to misguided treatment by prolonged rest.

Manipulation is of great value in the treatment of prolapsed intervertebral disc in the lumbar region, both in early and late cases, by unlocking the lumbar spine causing the prolapsed disc to retrace its steps and relieving pressure upon nerve roots by adhesions. Many cases of chronic backache are due to persistent protrusion of the nucleus pulposus and the presence of such adhesions.

In too many cases of chronic disc lesions a policy of immobilizing the lower back by plaster jackets and other means is adopted and in many the plaster jacket is worn over an unreduced disc prolapse.

The acid test of reduction consists in the ability to extend the lumbar spine fully without pain and the restoration of the lumbar curve.

Laminectomy is not infrequently a failure; it sometimes relieves sciatic pain but after a while this often recurs and it should never be performed without a trial of manipulation under anæsthesia which can be repeated if necessary.

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TRENDS AND ERRORS IN THE PRACTICE OF VENEREOLOGY

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Now that the incidence of venereal disease is steadily rising at a rate unprecedented in peacetime, proper case management is essential. By illustrating some of the commoner errors personally encountered, I hope that this article will help those who do not specialize in the subject.

URETHRITIS, SPECIFIC AND NON-SPECIFIC, IN MEN

A microscope and rapid access to full laboratory facilities are the first essentials. Without these no-one should regularly treat such cases, for no proper distinction between gonorrhœa and non-specific urethritis (N.S.U.) and the varied causes of the latter is possible without them. Normal flux due to semen, prostatic fluid or simple mucus and not needing treatment must also be distinguished. The unpardonable sin is to omit inspection of the urine for shreds or other abnormalities which are the sole signs of an active infection when there is not an overt discharge, or of relapse of the treated case. Shreds are composed of pus cells with or without gonococci or other organisms, epithelial cells, mucus, spermatozoa or an admixture of some or all of these components. Naked-eye appearances can be misleading and microscopy is required to determine their nature upon which depends the question of whether or not to treat. Phosphates excluded, urinary turbidity or haze is generally due to pus but occasionally to an admixture of seminal or prostatic fluid. Sometimes, routine inspection of a specimen by revealing an unsuspected urethritis may disclose the nature of a previously obscure arthritis or anterior uveitis. In suspected Reiter's disease, this is far simpler and more reliable than the outmoded and, for practical purposes, valueless gonococcal complement-fixation test (G.C.F.T.).

Omission of urinary inspection is often disastrous and the two following episodes are examples from a sizeable catalogue.

A male, aged 37, developed gonorrhœa from an extra-marital liaison. His discharge stopped after sulphonamide therapy and without urinary examination he was pronounced cured. In a week, dysuria developed and when seen he produced from a dry meatus cloudy urine full of shreds with gonococci. He also developed a gonococcal prostatitis and a secondary *Trichomonas vaginalis* infection and had infected his wife.

Two unmarried males with penicillin-resistant gonorrhœa cited a nurse who also had it. Three months earlier, after the return of her fiancé from Brazil, she said she had had 'cystitis' cured by a 'herbal mixture'. Later, I saw her reluctant fiancé who asserted that his gonorrhœa had been cured by ten twice-daily injections of penicillin. His urine had never been inspected and contained shreds packed with penicillin-resistant gonococci. Six months later, he developed a positive Wasser-

mann reaction (W.R.), the penicillin, at once excessive and inadequate, having masked an early syphilitic infection.

In routine cases, if a single intramuscular injection of a slowly absorbed penicillin—procaine penicillin in oily suspension to which has been added 2 per cent. of aluminium monostearate (P.A.M.)—not in excess of 600,000 units is ineffective, further or larger injections which only prolong, without significantly elevating, the blood level, are unlikely to do any good. Instead, a sensitivity test is indicated, pending the result of which a single injection (0.5 to 1 g.) of streptomycin followed, if unsuccessful, by a course of a tetracycline and then of a sulphonamide (or vice versa) is recommended. Should antibiotic resistance be complete a return to urethral irrigations for from four to six weeks would be indicated. No patient with uncured resistant gonorrhœa should be allowed to go to sea.

With N.S.U., a combination of a single injection of streptomycin plus a sulphonamide, a course of urethral irrigations (1 in 8000 potassium permanganate or oxycyanide of mercury) for seven to fourteen days, or a course of tetracycline (this is at least twelve times as costly) are standard treatments. In both conditions, surveillance should be for at least a month as relapse in N.S.U. is common and often detectable only in the urine.

PROSTATITIS AND STRICTURE

Two important, and often overlooked, complications are prostatitis and stricture.

In 1959 and 1960, in three of the clinics under my care, the incidence of prostatitis in the 524 cases examined from this point of view was 10.2 per cent., whilst the incidence of stricture in the 389 cases examined from this point of view was 5.9 per cent. The comparable figures for N.S.U. were prostatitis in 8.5 per cent. of 619 cases, and stricture in 5.9 per cent. of 492 cases.

No case was considered as one of prostatitis (prostato-vesiculitis is a more accurate term) when, after massage, there were less than an average of five pus cells per 1/12 field with clumping, or in the absence of clumping less than ten such cells.

No control series was possible and no claim is made that these figures represent the actual nation-wide incidence of these complications. Indeed, the individual clinic rates showed a wide variation. It will be noted that complications were almost as frequent in N.S.U. as in gonorrhœa. Equally interesting was the fact that, contrary to what most textbooks imply, they often occurred in patients with a normal urine and negative two-glass test. That tests of cure should always be done is illustrated by the following case:—

A man, aged 25, showed nothing abnormal on the third day following penicillin treatment of gonorrhœa. He defaulted, and when followed up there were still no signs five weeks later, but a prostatic bead contained pus cells and gonococci. In the interim, of five consorts, the two whom he knew were both infected.

Cases of this kind show the need for much greater stringency in the assessment of cure than has obtained in recent years and those not prepared

to adopt these standards should not undertake treatment, especially with increasing antibiotic resistance everywhere.

The treatment of prostatitis is not generally agreed even among experts. The majority opinion here considers twice-weekly massage to be the least unsatisfactory method. Most cases resolve within a month; six in this series required from three to six months and one a year.

A male, aged 21, with N.S.U. had two relapses. His urine always cleared at once, but a prostatic bead was purulent. No benefit accrued from standard antibiotics or urethral irrigations, but improvement followed each six-week course of prostatic massage, tending to regress during intervening rest periods. Finally after a year, and a ten-week course, the condition resolved and was still cured fifteen months later. Full urinary-tract investigations disclosed no abnormalities.

For the past two years it has been the renewed practice here to pass a curved metal sound on all cases as a final test of cure.

Like prostatitis, stricture may lead to recurrent urethritis and, having missed 12 cases until there was a recurrence in the Chester and Birkenhead clinics from 1955 to 1958, I feel I have been taught a lesson. In some clinics elsewhere, urethroscopy is also carried out. If a patient's progress is unsatisfactory, the prostate should be examined in the third week unless there is an acute discharge, and a sound be passed not later than the sixth week. A proportion of stricture cases are curable, the main errors being too abrupt an increase in the intervals between attendances and failure to dilate with a sufficiently large instrument. An occasional case of stricture may present with intense dysuria and, if upper urinary-tract investigations prove negative, this should be remembered. Prostatitis can do the same and in acute cases (usually healthy young men) can cause sudden retention of urine.

GONORRHŒA AND OTHER CONDITIONS IN WOMEN

The traditional vaginal swab is useless in the diagnosis of gonorrhœa except in pre-pubertal vulvo-vaginitis.

Recently, a lady in hospital, aged 24, was found to have a post-partum discharge. Three vaginal swabs were negative for gonococci and she was sent home but within a day or two the baby was found to have a gonococcal vulvo-vaginitis, and mother, too, both urethral and cervical smears being positive.

As the large residue of undetected and unsuspected gonorrhœa in females is at the root of the problem, constant vigilance is essential among magistrates, probation and moral welfare officers and all who have charge of young girls, with efforts to persuade those possibly infected to attend the clinics for investigation. It must be remembered that many female cases are symptomless and diagnosis from clinical inspection and repeated smears and cultures taken under direct vision is often difficult. Promiscuous females unlikely to attend again should be treated at once to protect the public so far as possible, but in married women in particular, repeated tests should be carried out before treatment.

Consorts of N.S.U. patients need examination. In larger centres, special

sessions are sometimes held in another department altogether, but in smaller clinics this is often not possible.

Nevertheless, out of the last 90 patients so referred by their consorts to the Birkenhead and Chester clinics, only one objected. Two others refused to come at all. Fifty-six were married, 53 being referred by their husbands.

If a patient complains of a vaginal discharge, a yellow or greenish discharge with dysuria suggests gonorrhœa, a profuse discharge with irritation a trichomonal infestation, and less discharge with intense irritation, especially in pregnancy, thrush. Proper investigation is always desirable and, if the husband or consort has a urethritis, essential. If irritation be dominant and investigation be not feasible, either nystatin or pessaries of acetarsol B.P.C. should be used, the former relieving thrush and the latter trichomonal infestation. If, after relief, the second recurs it might then be justifiable to give metronidazole which also must always be given to the male consort whenever possible. Proper identification of the parasite in one partner is highly desirable, for indiscriminate usage of this valuable preparation is likely to promote drug resistance.

SYPHILIS

In 1939, there were 117 new cases of early syphilis at the Seamen's Dispensary, Liverpool; in 1960, there were 59—almost exactly half. The corresponding figures in England and Wales for 1939 and 1959 (estimated from the quarterly returns) were 4,986 and 744. This suggests that, although a number of cases still arrive at the main ports, there is little spread to other areas, the result presumably of rapid cure by penicillin as opposed to the lengthy period with heavy metal therapy. Cure is now complete, and few default so that infectious relapse has practically disappeared which in my personal view is the main reason for the spectacular decline in the number of early cases.

Nevertheless, constant care is still needed and no undiagnosed penile lesion should ever be treated with penicillin, owing to the risk of masking but not curing primary syphilis, the diagnosis of which must always be proved either by positive darkground or a W.R.; the latter occasionally takes up to ninety days to develop after the first appearance of the chancre. Moreover, penicillin is ineffective in almost all non-syphilitic conditions such as chancroid, lymphogranuloma venereum or acute balano-posthitis for which sulphonamides are indicated and which generally should be observed for four months subsequently to exclude concomitant syphilis. No case of purulent balanitis with temporary phimosis, either primary or secondary to a urethral discharge, should be given penicillin until preputial retraction excludes an underlying sore. Normal saline but nothing else is the recommended local treatment. With balanitis, glycosuria should be excluded or, if present, investigated before circumcision is considered. When penicillin has been given, the case must forthwith be diagnosed as syphilis and

treated properly so as to exclude finally any risk of further trouble. In such cases the difficulties with consorts, especially if marital, are enormously increased. The present position at sea where unqualified persons are empowered to give penicillin and do so in haphazard dosages to seamen with obscure genital lesions who often fail to report subsequently for skilled advice, should be clarified, as otherwise missed cases of syphilis may occur.

The safe dosage for a proved sero-negative primary case is ten daily intramuscular injections of P.A.M., 600,000 units; 9 mega units are suggested for the sero-positive primary and 12 mega units for the secondary stages. Except in cases of penicillin sensitivity there is no justification today for the use of an arsenical. All cases require a two years' follow-up after the W.R. has become negative, and a cerebrospinal fluid examination.

All stages of syphilis provide opportunities for error and in any unusual case a W.R. is indicated. The disease is not excluded because a patient is exceptionally nice or of great social distinction! When simultaneously engaged in other specialties, I have missed cases myself.

A lady of twenty with apparent Vincent's angina and a negative W.R., in whom the correct diagnosis of tonsillar chancre was made through casually noticing a visiting boy friend then under treatment at the clinic; another with supposed glandular fever for two weeks which was secondary syphilis; and the male outpatient ordered a cholecystogram for tabes dorsalis, are examples.

My nadir was a lady with early pulmonary tuberculosis who developed hoarseness stated on laryngoscopy to be 'compatible with tuberculous laryngitis'. With streptomycin then a new toy, any differential diagnosis was unheeded until, after three months of ineffective treatment, a blood W.R. was strongly positive and disappearing vulval condylomas were noted.

Diagnosis of latent syphilis.—No diagnosis of latent syphilis should be made without at least one repeat of a positive blood test.

In cases with weak or doubtful W.R.s or of conflicting results between Wassermann, Kahn or Meinicke reactions, which may be false biological reactions, recourse should be made to the newer tests such as Price's precipitation reaction, Reiter's protein complement-fixation test and sometimes the treponema immobilization test (T.P.I.). As the capacity of the existing V.D. Reference Laboratories is limited, specialist advice is suggested first.

TREATMENT OF LATENT AND LATE SYPHILIS

There is a fallacy that all cases in every stage of syphilis can be cured by ten penicillin injections.

A man of sixty-two in hospital was given 7 to 8 mega units of penicillin for pneumonia. The blood W.R. was strongly positive, and for this the consultant advised no action as the administered penicillin 'would take care of it'. Four years later, a serious fall resulted in the discovery of advanced tabes dorsalis. Ideally, all cases of latent syphilis should have an initial cerebrospinal fluid examination (especially in hospital!) which in this instance might have disclosed some abnormality.

A man of 54 was given a 'token' course of ten injections of penicillin for 'burnt-out' tabes dorsalis which three years later incapacitated him from work because of severe pains. Prolonged re-treatment (often disappointing at this stage) has enabled him to resume work as a road-mender, relatively symptom free.

A man, aged 36, developed G.P.I. and having improved after 6 mega units of penicillin was discharged. Six months later he had a mortal relapse and I was asked to see him, too late, except as a warning against underestimating this extraordinary disease.

An issue both difficult and delicate that is often burked is the examination of consorts, particularly of a family.

A lady was infected in 1944 by her first husband just before his death in Normandy. She had two injections of an arsenical only, but in 1946 remarried and in 1947 when pregnant had sufficient treatment to protect the child but her second husband was never sent for. In 1958 he was referred totally blind with optic atrophy and early tabes.

The consequences of such an omission may thus not appear for years.

The requisite amount of treatment for late cases is not generally agreed but better too much than too little. In our clinics it is customary to give 12 to 21 mega units of penicillin intramuscularly for the first course; either as 600,000 units daily or as 1.2 mega units bi-weekly. No advantage accrues from larger or more frequent injections. Three to five maintenance courses are given at intervals of two to three months: 1.2 mega units weekly or bi-weekly or 2.4 mega units weekly in larger individuals, supplemented in certain instances with a course of bismuth. Rapid serological reversal to negative may be an indication for shortening the treatment, but failure to revert is no reason for its prolongation. In cardiovascular, neurological and gummatous cases, a preliminary course of iodides and bismuth is advisable to avoid a Jarisch-Herxheimer reaction which even a tiny dose of a thousand units of penicillin may provoke. These reactions may be rare but they do occur and may be disastrous—and I write from experience. It is important to complete treatment as quickly as possible. Long gaps between courses or restarting after a year's interval are demoralizing for the patient and predispose to default. In any case, the tendency to default is much greater during the surveillance period than when active treatment is being given.

It is sometimes argued that once the active lesion has firmly healed, further treatment is redundant and merely adds to the patient's burden. The real aim, however, is cure or at least permanent quiescence of the disease as a whole, with which the healing of a tertiary lesion is not synonymous, whatever the treatment.

Five injections of arsenic and bismuth in 1942 completely healed gummatous ulceration of the palate in a female patient but, as might be expected, she developed an aortic lesion in 1956.

The same would happen in some cases with too little penicillin as the cases quoted above testify.

MATERNAL AND CONGENITAL SYPHILIS

There is a tendency to give 'prophylactic' treatment to infants born of syphilitic mothers without a proved diagnosis of congenital syphilis, for which cord blood is unreliable.

A child of ten days was given four injections of penicillin without proper diagnosis or follow-up and at the age of 8 years developed interstitial keratitis.

If a child has been so treated, he should be kept under surveillance for two years after an adequate ten-day course of penicillin.

When the mother has been adequately treated in pregnancy, a routine W.R. on the child at one month and six months should suffice. If the mother has not had treatment, monthly tests for the first six months and a final W.R. at one year are advisable. If syphilis is discovered in a family when the children are older, they should all be examined and if the standard tests are negative it may on occasion be wise to call on the resources of a Reference Laboratory, especially if one child is known to be infected. Unless she so wishes, pregnancy treatment of a woman previously cured of primary or secondary syphilis is not essential though the baby should be examined. All those who have ever had latent or late syphilis, even if considered cured, should have penicillin early in every pregnancy.

A patient whose latent syphilis was diagnosed in 1943 had four courses of arsenic and bismuth and two of penicillin during which time she produced two normal children. Her W.R. remained positive but the cerebrospinal fluid was normal and she was considered cured. For each of her third to eighth pregnancies she subsequently had a course of penicillin always before the seventh month. For her ninth she omitted to attend until within three days of delivery of an infant with congenital syphilis. Treated early in her next pregnancy, the tenth child was normal. Her husband, checked in 1943 and again in 1958, has never had the disease.

Any woman who has given birth to a syphilitic child must have standard blood tests and, if negative, ancillary ones including a T.P.I. Even then, the cerebrospinal fluid should be examined and may be found to be abnormal as in a recent case of mine in 1957, who had had a syphilitic child in 1941 and whose blood W.R. had always been negative.

Syphilis is now at bay but undefeated; there is a real tendency to underestimate it. Less often encountered, it is important to keep it in mind because missed or mismanaged cases can still result in personal tragedies for patients, their families and consorts.

SOME PUBLIC HEALTH ASPECTS

Cooperation over prevention between hospitals and local authorities is generally satisfactory. In most areas, however, the advertisements of clinic times and sites are scandalously inadequate. The usual methods are by metal plates or special posters—the latter provided free—which are displayed in public lavatories, on notice boards and are, on occasion, supplemented by local press notices. The trouble is that insufficient notices are displayed, that metal plates are consistently removed by collectors of such articles and posters are torn down. If metal plates cannot be made impregnable, the remedy is surely to provide a local authority officer with a large number of posters and charge him with the duty of replacing all defaced posters every week. Every public lavatory should have one, especially in railway stations. The most bitter complaints are constantly being received from patients who naturally do not wish to make public inquiries; some even go from town to town in fruitless search.

A special section in telephone directories would help. Few people realize that they have to search under the heading of the Regional Hospital Board in question.

EDUCATION

The stigma attached to the clinics in the public mind, though less, is still there. In view of the increasing prevalence and changing nature of the diseases with which they deal, it is important that it should further diminish. The general practitioner is often the best person for this by endeavouring to educate his patients that attendance at a clinic does not necessarily cast a slur on an individual's morals or integrity, but is simply to obtain an opinion that is best suited to the case as in any other department.

In some schools of nursing, scant attention is given to the subject with the result that without even rudimentary knowledge a minority of nurses are somewhat scared and may develop a faulty attitude to these patients, solely the result of lack of training. Two or three lectures are sufficient to remedy this.

Anyone can practise venereology indifferently; to perform with skill requires considerable art coupled with certain basically simple but essential techniques about which it is hoped that this article will be of help to the non-specialist.

SUMMARY

The basic principles in the management of gonorrhœa and non-specific urethritis are described, with cases illustrating the results of their neglect. The incidence, diagnosis and treatment of prostato-vesiculitis and stricture as complications of these conditions are considered and a plea made for greater stringency in tests of cure. Trends in incidence are mentioned, and some problems of gonorrhœa and other conditions in the female are discussed.

The correct management of early syphilis is discussed, followed by that of latent, late, congenital and maternal syphilis, and some mistakes are described.

Attention is drawn to the serious inadequacy of the arrangements for advertising the whereabouts and times of clinics and possible remedies are suggested.

A plea is made for minimal education on the subject to be given in nurse training schools where this is not already done.

I wish to record my thanks to my colleagues at the Seamen's Dispensary, Dr. E. E. Prebble the Clinic Director, Dr. F. Lanceley and Dr. A. S. Egerton, for permission to include their case records. To my former colleague, Dr. D. F. Johnstone of the Scott Hospital, Plymouth, I am doubly grateful: in the first place for permission to refer to patients in that hospital; secondly, in that indirectly his article 'Mistaken diagnosis in infectious diseases' (*Brit. med. J.*, 1944, **i**, 555) suggested the line of approach in this article.

MANAGEMENT OF THE PATIENT WITH MENORRHAGIA

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MENORRHAGIA is a symptom, not a disease in itself. The general practitioner will see many patients with this complaint and should have clear ideas on the management of the condition, since such patients should only be referred to a gynæcological clinic when hospital investigation and treatment are indicated, and many patients with cyclical dysfunctional uterine bleeding respond to conservative treatment.

HISTORY AND EXAMINATION

To assess the problem properly, an accurate menstrual history is obtained and related to the patient's previous medical history, her present general physical condition, her hæmoglobin level, and age. A pelvic examination is then necessary to check the state of her pelvic organs. When a pelvic abnormality exists—tubal inflammatory disease, pelvic endometriosis, fibroids, cervical or ovarian disease—a gynæcological opinion is obtained. Pain—e.g. dysmenorrhœa, dyspareunia or low backache—may also be a complaint in these cases, and it will help in the diagnosis. When no abnormality can be detected on examination of the pelvis, the cause of the menorrhagia may be intra-uterine disease, endocrine dysfunction or, in rare cases, blood dyscrasias. Some intra-uterine abnormalities may be detected at curettage—endometrial polypi, submucous fibroids, endometrial or endocervical carcinoma—but histological examination of the curettings may be required before the diagnosis can be made: tuberculous endometritis, chronic endometritis, placental polypi, and the early stages of malignant disease.

Endocrine dysfunction may manifest itself as an obvious clinical syndrome, e.g. hypothyroidism, or may only be diagnosed after histological examination of the endometrium. This latter type of dysfunctional bleeding includes conditions such as metropathia hæmorrhagica, irregular ripening and shedding of the endometrium, anovulatory cycles (Sutherland, 1949) and 'stress' menorrhagia (Blaikley, 1949; Morris and O'Neill, 1958). Because psychic stress can produce a menstrual upset, a possible stress factor should be looked for when questioning a patient who has no apparent disease to account for her heavy bleeding. Hæmorrhagic tendencies may produce menstrual aberrations which may be associated with severe bleeding from the nose, gums or other mucous membranes, but menorrhagia can be the sole manifestation of a blood disorder. To screen patients for a suspected hæmorrhagic diathesis a careful family and personal history to exclude abnormal bleeding episodes and a bleeding-time determination are sufficient. Further detailed tests are required when an abnormality is

detected but these require hospital facilities (Radman, 1960; Seaman and Benson, 1960).

When no obvious cause can be found for the menorrhagia, a diagnostic curettage is advisable in many patients who are over the age of 35 years and most, if not all, who are 40 years of age or more. Diagnostic curettage with appropriate investigation of the cervix is essential for patients with acyclical bleeding (metrorrhagia or acyclical dysfunctional bleeding) or post-coital bleeding, or when any doubt exists about the normality of the pelvic organs at vaginal examination. Malignant disease can thus be excluded and rational hormone therapy started to arrest the menstrual disability in patients who are not benefited by the curettage alone. Curettage should be avoided in young girls, except when there is severe anæmia or a history of tuberculosis. Œstrogens and progesterones, singly or in combination, can safely be used in this age-group to control the heavy periods for three months or so to allow the normal cycle to become established.

SCOPE OF INVESTIGATION

After careful assessment in this manner, women in the middle period of their menstrual life can reasonably be treated conservatively by their doctor in the first instance, provided their hæmoglobin is not below 60 per cent., and provided they have had a careful pelvic examination which confirms the presence of normal pelvic organs and shows the cervix to be healthy when it is seen through a speculum. It is important not to use male or female hormone preparations unless there has been a recent diagnostic curettage and a histological report upon which the choice of endocrine regime can be based. A useful form of treatment which avoids such hormones is a combination of thyroid, calcium and iron. Thyroid antagonizes œstrogens, iron combats anæmia, and calcium has an empirical efficacy which has stood the test of time.

Sixty-two patients were selected for the trial of this regime. They attended the outpatient clinic of the professorial unit at the Hospital for Women at Leeds. After a careful history had been taken, and the hæmoglobin confirmed to be 60 per cent. or more, a pelvic examination was made and the presence of a normal uterus, adnexa and cervix confirmed. Treatment was then initiated with $\frac{1}{2}$ grain (30 mg.) of thyroid B.P. twice daily for one month, 40 grains (2.4 g.) of calcium lactate daily for three months, and 10 grains (0.6 g.) of ferrous gluconate three times daily for three months. The patient was asked to return to the clinic in three months, but she was instructed to return at any time before this should she develop irregular bleeding or such heavy periods that she could no longer manage without further help. If no improvement in the menstrual cycle had occurred after three months, a diagnostic curettage was arranged. If some improvement was noted, the calcium and iron were repeated for three more months. If a satisfactory response had not been achieved by six months, admission for curettage was advised.

RESULTS

Four of the 62 patients did not return to the clinic for assessment. One patient had pulmonary tuberculosis and was admitted for curettage; tuberculous endometritis was discovered by histological examination of the endometrium. One patient had a positive cervical smear: she had a curettage and cervical biopsy performed and biopsy showed carcinoma *in situ*. Three patients omitted to take the tablets: two of them were menstruating normally after three months, and one had a diagnostic curettage after which menstruation became normal. Eight patients were admitted to hospital for curettage before the conservative regime could be instituted: six became normal after curettage, and two required methyltestosterone to complete the restoration of their normal cycle.

Forty-five patients had a full trial of the regime, 37 successfully. Six of the eight failures had a diagnostic curettage. One was noted to have metropathia and the other five had an apparently normal endometrium. All became normal after the curettage. Two of the patients who did not respond to the thyroid, calcium and iron therapy responded to a course of methyltestosterone. One had been investigated for infertility and the other had undergone a vaginal plastic repair operation one year previously, so that recent reports on endometrial histology were available.

Of the 37 patients who responded, 20 were satisfactory after three months, and 17 after six months, of treatment. Nineteen of the 27 patients 30 years of age or younger were cured after three months, whereas nine of the 10 patients over 30 years of age required six months' treatment for the improvement to take place. Seven of the eight failures occurred in the 17 patients over 30 years of age, but there was only one failure in the 28 patients 30 years of age or younger.

It was noted while this trial was on, that the combination of thyroid, calcium and iron had no effect on normal menstrual cycles and did not benefit patients with premenstrual tension.

CONCLUSION

Treatment by thyroid, calcium and iron is safe and effective for patients with menorrhagia provided that they are carefully selected. Thirty-seven (82 per cent.) out of 45 patients referred to a gynæcological clinic because of menorrhagia responded to this regime.

I wish to thank Professor Sir Andrew Claye for his help and advice on the preparation of this article.

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MEGALOBLASTIC ANÆMIA OF PREGNANCY

A REPORT OF FOUR CASES

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In 1958, Giles and Shuttleworth reported that megaloblastic anæmia of pregnancy was commoner than was generally realized, and that in a fifteen-month period at Stoke-on-Trent it accounted for nearly 20 per cent. of all cases of severe anæmia (i.e. hæmoglobin less than 65 per cent. after the 32nd week of pregnancy), and 2.8 per cent. of all obstetric admissions. The following four cases (table I) are reported to support this thesis, and to illustrate different and unusual ways in which this anæmia can present. All occurred during a period of six months in one ward of 20 obstetric beds. They were four out of the only five patients known to have hæmoglobins of less than 50 per cent. during this time (the fifth had a bleeding peptic ulcer).

CASE RECORDS

Case 1: Puerperal fever.—A primigravida, aged 20, who had been admitted to an isolation hospital as a case of puerperal pyrexia, following a normal delivery ten days before at a General Practitioner Unit, had been found to be anæmic, with a hæmoglobin of 46 per cent. She had been treated with intramuscular iron. There was no previous history of anæmia.

State on admission.—The temperature was 100°F. (37.8°C.), and the urine and a high vaginal swab were sterile.

Blood picture.—Red blood cells: 2.5 million per c.mm.
Hæmoglobin: 50 per cent.
Packed cell volume: 25.
White blood cells: 10,400 per c.mm.

Sternal marrow.—'Megaloblastic anæmia of pregnancy'.

Subsequent course.—The patient was treated with oral iron and folic acid and discharged home one week later when the hæmoglobin was 60 per cent. The maximum reticulocyte response was 15 per cent. The temperature settled without further treatment.

Case 2: Cardiac failure.—A multipara, aged 40, admitted in the 36th week of her fifth pregnancy with gross ankle œdema, was found to be in high output cardiac failure due to chronic anæmia. There was a history of severe anæmia five years previously which was treated by blood transfusion.

Blood picture on admission.—Red blood cells: 1.7 per c.mm.
Hæmoglobin: 32 per cent.
Packed cell volume: 14.
White blood cells: 2,500 per c.mm.

Sternal marrow.—'Megaloblastic anæmia of pregnancy'.

Subsequent course.—She was treated with bed rest, oral diuretics, iron and folic acid, and lost 28 pounds (13.8 kg.) in weight in a fortnight with disappearance of cardiac failure. Death of the fœtus occurred *in utero*, followed by spontaneous onset of labour at the 38th week of pregnancy, and normal delivery of a still-born infant. Post-mortem examination showed that death was due to maternal anæmia. The

post-partum hæmoglobin was 68 per cent., having risen to 58 per cent. immediately preceding delivery. The maximum reticulocyte response was 28 per cent. When seen for postnatal examination six weeks later, the hæmoglobin was over 80 per cent.

Case 3: Severe accidental hæmorrhage.—A multipara, aged 40, was admitted in the 32nd week of her 10th pregnancy with concealed and revealed accidental hæmorrhage. There was no previous history of anæmia, apart from the fact that earlier in the pregnancy the midwife had suggested that she looked anæmic.

State on admission.—She was severely shocked, and was transfused with 5 pints (2.8 litres) of whole blood. Spontaneous onset of labour occurred, with normal delivery of a still-born infant. She was then found to be very anæmic in spite of minimal blood loss at delivery.

Blood picture after delivery.—Hæmoglobin: 38 per cent.
Packed cell volume: 19.
White blood cells: 12,600 per c.mm.

Sternal marrow.—'Mildly megaloblastic type of erythropoiesis'.

Subsequent course.—She was treated with oral iron and folic acid and prophylactic antibiotics. Ten days later, the hæmoglobin was 56 per cent., with a maximum reticulocyte response of 17 per cent.

Case 4: Sore throat with leucopenia.—Because of a perineal laceration in a previous labour, a multipara, aged 25, who had had four miscarriages was booked for a hospital delivery for her sixth confinement. When seen at the antenatal clinic in the 34th week, she complained of a severe sore throat with dysphagia and loss of weight, for the previous month. On examination the throat was found to be ulcerated

Case no.	Age	Parity	Mode of onset	Hb %	M.C.H.C. %	M.C.V. c. μ	W.B.C. c.mm.	Marrow report	Maximum Reticulocytosis %	Hb. after treatment %
1	20	0	Puerperal fever	46	29.6	100	10,400	Megaloblastic	15	60 in 10 days
2	40	4	Cardiac failure	32	33.6	83	2,500	Megaloblastic	28	68 in 3 weeks
3	40	9	Severe accidental hæmorrhage	38	30.7	74	12,600	Mildly megaloblastic	17	56 in 10 days
4	25	5	Sore throat; leucopenia	38	35.0	85	1,600	Severely megaloblastic	50	64 in 3 weeks

M.C.H.C. = mean corpuscular hæmoglobin concentration.
M.C.V. = mean corpuscular volume.

TABLE 1.—Summary of essential features of four cases of megaloblastic anæmia in pregnancy.

and she was mildly febrile (99.6°F. [37.5°C.]). She was sent home under her own doctor's care. A throat swab was sterile, and the hæmoglobin was 62 per cent., with a microcytic, hypochromic blood film. She was readmitted four weeks later with the baby born before arrival at hospital. She then looked very ill, pale and feverish (103°F. [39.4°C.]), and examination revealed an ulcerated mouth and throat. There was no previous history of anæmia.

Blood picture after delivery.—Hæmoglobin 38 per cent. falling to 34 per cent.
Packed cell volume: 16.
White blood cells: 1,600 per c.mm.

Sternal marrow.—'Severe megaloblastic anæmia of pregnancy'.

Subsequent course.—In view of the leucopenia, ulcerated throat and marked worsening of her general condition, a diagnosis of aplastic anæmia, and even aleukæmic leukæmia was considered until the marrow was examined. She was started on oral iron and folic acid. A high vaginal swab grew *E. coli* and she was given a five-day course of streptomycin. The mouth ulceration responded to hydrocortisone hemisuccinate lozenges, but she then developed a herpetic eruption around her mouth. A fortnight later the hæmoglobin was 64 per cent., with a maximum reticulo-

cyte response of 50 per cent. The white blood cells rose to 20,000 per c.mm. and then returned to normal six weeks later when her hæmoglobin was over 80 per cent.

DISCUSSION

All these patients had a hæmoglobin of less than 50 per cent. and on oral iron and folic acid all achieved a reticulocyte response of 15 per cent. or more (the one of 50 per cent. was quite exceptional). This alone would be sufficient to suggest very strongly a diagnosis of megaloblastic anæmia. The rapid rises in hæmoglobin were also most striking, and were in contrast to the severity of the condition, which proved fatal to one infant and endangered the life of the mother (had she gone into labour earlier).

Giles and Shuttleworth comment that the blood picture is seldom diagnostic and that was our experience. Most films were reported on as normal, but one was both microcytic and hypochromic. M.C.H.C. was usually normal, but one was less than 30 per cent. The low white cell count in the two most severe cases was interesting, particularly in relation to the throat ulceration. Serum irons were not helpful as three of the patients had been treated with parenteral iron. Gastric analyses were performed on two cases (case 1, normal; case 3, hypochlorhydric), and fæcal fat estimation on two (case 1, normal; case 4, steatorrhœa). Serum B_{12} estimations were done in all cases before the treatment started and all were normal.

The incidence in this small series is similar to that in Stoke-on-Trent: i.e. 2 per cent. Giles and Shuttleworth had the impression that complications of the anæmia were not as common as other reports had suggested. The only obstetric complication in this series was the accidental hæmorrhage. All four patients ran low-grade fevers: this was the presenting symptom in case 1. Only one, case 4, was proved to have an infection. Vaughan-Jones and Payne (1960) consider that pernicious anæmia, but not iron-deficiency anæmia, can *per se* give rise to fever. It is interesting to speculate as to whether megaloblastic anæmia of pregnancy can do likewise.

Finally there must be a reason to account for these cases being missed despite adequate antenatal care. This may be due partly to the fact that clinically they do not appear as anæmic as a corresponding iron-deficiency anæmia, and partly because the hæmoglobin may, as in the fourth case, drop very suddenly in the last weeks of pregnancy.

SUMMARY

Four cases of proved, severe, megaloblastic anæmia of pregnancy are reported, to show the unusual ways in which it may present, other than as a simple anæmia.

My thanks are due to Mr. P. R. Mitchell, under whose care these patients were admitted, and to Dr. H. G. H. Richards, the pathologist, for their encouragement in the preparation of this article.

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BREATH-HOLDING ATTACKS

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THE following query was recently submitted to me by the Editors of *The Practitioner:*

'A girl, one year old, fit, cheerful and active, quite normal otherwise, literally ceases to breathe once provoked into crying. She gives a deep 'in breath', then the breathing completely stops, and she turns blue with tight set teeth. It takes some frantic moments to revive her. This occurrence has become rather frequent and the parents are naturally worried. The pædiatrician whom they consulted did not give them a convincing explanation. I was able to advise them on how best to revive her once she lapses into unconsciousness.

'I should be most grateful if you could suggest anything to prevent these attacks and also let me know what causes them. What is the best remedy?'

This query describes a syndrome which is common enough for most parents to have observed with one child or another. It always causes consternation over how to treat attacks. It often leads to the anguish of a mistaken diagnosis of epilepsy. It sometimes poses a serious diagnostic problem, as in the case of a toddler labelled 'traumatic post-concussion epilepsy'. There may be much wastage of inappropriate drugs, since phenobarbitone and other anticonvulsants afford no relief to the tendency. And it has the rarity of being a condition for which the learned have failed to find a fancy Greek name.

ETIOLOGY

It is not known why some healthy babies and toddlers develop this inconvenient mechanism whenever they are surprised by pain. It may be physical pain, as in bumping the forehead or stubbing the toes; or it may be emotional, when a toy is snatched out of the hand, or father commands the child to eat up his meat with the potato. It is unfair to blame neurotic instability, as it may occur from the earliest weeks of life. It is essentially involuntary, and seldom due to negativism or voluntary exploitation of the distress of parents. It is self-limited in time to the first three to five years of life. It is never fatal. In a very few predisposed children the anoxia of the brain during an attack may provoke secondarily a true epileptiform convulsion, which complicates both diagnosis and treatment.

DIAGNOSIS

The essence of diagnosis is that attacks regularly interrupt a bout of crying, with arrest of respiration when the chest is empty (the description in this query refers to the child giving a deep 'in breath': it would be worth checking whether this is an ineffectual attempt to fill the chest once arrest

has occurred). It is best recognized by allowing parents to relate the story in their own words, which are often diagnostically bizarre: 'Every time she cries she kinks'; 'He cannot get his second cry'; or 'She gave a right big yell and then caught her breath and could not start breathing again'.

Because these words were not pondered by the casualty officer, the toddler already referred to was committed to the ward on a half-hourly pulse with skull radiographs. When this supposed brain injury with unconsciousness was followed in two months by two fits, the ominous diagnosis of traumatic epilepsy was made. Only later was it elicited that she had not cracked her skull on the concrete floor of the back yard when she first stumbled, but had grazed her nose upon a vertical drain pipe. And the subsequent fits were of identical pattern, on bumping her forehead when standing up beneath a table.

Once a child displays the breath-holding syndrome his attacks are usually frequent: several a month, or even a week. The parents' description is not always adequate for making a confident pronouncement that the child's attacks are of the innocent breath-holding sort, and judgment must sometimes be kept in suspense, pending more accurate observation of any future attack. A diagnosis of febrile convulsions of infancy should be supported by signs of an adequately pyrexial infection, and generalized clonic muscle spasms, which are not characteristic of breath-holding swoons. Idiopathic epilepsy will be diagnosed if clonic fits recur without febrile provocation. The same pain stimulus which we commonly find in breath-holding may cause simple faints with sudden profound pallor and imperceptible pulse, but these would lack the sharp initial cry and the cyanosed sudden arrest of breathing.

PREVENTION AND MANAGEMENT

Prevention aims to reduce the frequency of attacks of crying. In so far as it arises from sudden physical pain, this is a matter of domestic watchfulness and accident-prevention on behalf of toddlers. The avoidance of emotionally painful outbursts of crying lies in consistent discipline, whereby the child realizes that nothing can be gained by the self-advertisement of tantrums. There is no drug treatment.

Actual attacks need no treatment because recovery is spontaneous and rapid. In no circumstances should the situation be dramatized by slapping, pinching or drenching the child with water. To count down slowly from twenty to zero is as useful a procedure as any.

In rare cases which go on to a true major convulsion, the child should be laid on one side and the tongue protected from being bitten. In such cases alone is there reason for prescribing anticonvulsants, such as phenobarbitone in a dose of $\frac{1}{4}$ to $\frac{1}{2}$ grain (15 to 30 mg.) twice daily, according to the size and tolerance of the child. In this very small minority of cases, anticonvulsant drugs may well be continued until a year after the last breath-holding attack, or longer if there seems reason to think the brain may not have reached the level of maturity at which generalized fits would be inhibited, perhaps until the age of 5 years.

THE SCOPE OF MEDICAL PROBLEMS IN NUCLEAR WARFARE

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THE consequences of a thermonuclear attack upon Britain in the future cannot be anticipated, for they depend upon the weight and quality of the missiles and the effectiveness of counter measures. Hence, medical planning must take into account all grades of severity. From the experience of past wars, atomic bombs over Japan, thermonuclear explosions and peacetime civilian disasters a complex organization has been developed to minimize the damage and preserve life. The purpose of this article is to outline the scope of the problem.

MODERN METHODS OF ASSAULT

The climax for high-explosive bombs was reached in March 1945, when an air raid upon Tokyo devastated 16 square miles of the city, killing an estimated 83,000 persons and injuring 102,000. This was the most intensive single attack in the 1939-45 War, and the casualties exceeded those caused a few months later by atomic bombs at Hiroshima (65,000 dead, 72,000 wounded) and Nagasaki (39,000 dead, 25,000 wounded). The atomic explosions, however, immediately made conventional weapons obsolescent because each attack was launched from a single aircraft instead of 270 aeroplanes which took part in the raid upon Tokyo (Oughterson and Warren, 1956).

During the period, 1945-50, emergency plans for defence were undertaken with some confidence in Britain. Obvious target areas were demarcated and, by means of dispersal and rescue parties, the effects of atomic explosions although formidable seemed to be manageable. Since 1950, with the development of thermonuclear weapons, reappraisal has been necessary. Instead of a 'nominal' bomb, as used in Japan and having an energy equivalent of 20 kilotons of TNT, much more powerful devices have become available of which, for example, a 10 megaton bomb has 500 times the explosive power of a nominal bomb and is followed by a dangerous fall-out. Concurrently, refinements in the methods of delivery have led the nation to believe that a 'saturation' attack is now possible. Indeed, an unopposed assault of sufficient weight to nullify temporarily the nation's means of existence is now possible. A single raid of this nature would hardly destroy the whole population, much of which would be under cover or remote from the points of detonation, and would later assist in rescue work. The dangers lie in repeated attacks or the employment of radioactive materials having a slow rate of decay, possibly interspersed with chemical

and biological agents. If these could be sustained, they would eventually lead to total destruction. For strategic reasons, an enemy might be content with less than this, relying upon a collapse in morale and territorial occupation to complete a conquest. Fortunately, countermeasures exist which, it is hoped, will successfully neutralize offensive missiles at source or in transit.

PRECAUTIONARY MEASURES

Community planning.—Preparations have been made at national, regional and local levels by the many governmental agencies which are inevitably concerned with total war. They include the provision of food and water, transport and communications, evacuation and dispersal of the population, care of babies and the aged, maintenance of industrial processes, and mobilization of the police and armed forces. The civil defence services are particularly concerned with methods of personal protection, fire fighting, rescue work and first aid. The medical aspects embrace accommodation for the sick and injured, distribution of medical personnel, drugs and dressings and prevention of epidemics. Radioactivity will be measured by selected formations and individuals, using the various types of exposure meter, and surveys will be prepared for the information and action of local wardens of the Civil Defence Services. These plans are, for the most part, available for study and form the basis of individual planning. ('Manual of Civil Defence', 1956; 'The Hydrogen Bomb', 1957.)

Individual planning.—Among the many measures that can be taken, the following would seem to be the most important. Whitewashing of windows and the removal of inflammatory material from the vicinity and from doorways greatly reduces the hazards of fire from heat flash. In the event of an attack, all coal, gas and electric fires must be extinguished, and attempts should be made to control small fires resulting from the explosion before taking shelter from possible approaching fall-out. The hazard from falling debris is likely to be least in a slit trench or dug-out covered with three feet (0.9 metre) of earth, a basement or a protected part of a building farthest away from an outside wall. These sites also afford protection from radioactive dust, the intensity of radiation at any point depending upon the distance the rays have to travel, the weight of material through which they must pass and the rate of decay. A two weeks' supply of food should be maintained, and all uncontaminated water in buildings at the time of the explosion must be carefully preserved. Sanitary arrangements and first-aid kit must be made available. Mass burials are preferable to burning, which causes an unpleasant smell and leaves a bulky residue.

MANAGEMENT OF CASUALTIES

The prime considerations in medical planning are a chain of authority throughout the country and the dispersal of medical manpower and equipment, but the imponderables inherent in nuclear warfare are formidable.

Environment.—The medical services may be forced by circumstances to work at considerable disadvantages, with serious deficiences in both staff and material. For example, when atomic bombs were dropped on Japan, 90 per cent. of the doctors, nurses and fire-fighters were casualties; no rescue parties arrived within thirty hours; no effort was made to repair water leaks, which occurred principally in private houses, and refuse and excreta were not removed for three months. In circumstances such as these, perhaps the most valuable type of medical unit is one of which the essential equipment, previously assembled, can be contained in and transported by a single vehicle and be made ready within a few hours in an appropriate place; emergency medical packets need to be widely dispersed.

Collection of casualties.—The means of rescue and evacuation of non-nuclear casualties are well known and are based upon experience from the recent past. The added complication of radioactive fall-out necessitates a curtailment of these activities. In the event of an attack, the civilian population will be instructed to remain under cover for at least forty-eight hours, but the rescue and fire-fighting services and others will perforce be exposed. Whilst the effects of radiation depend upon the rate of exposure and the total dose absorbed, the LD 50 is ordinarily regarded as being about 450r and the maximum exposure compatible with safety is about 50r. Hence the early collection of casualties will be influenced by the availability of rescuers whose exposure, which should be measured by personal dosimeters, has not exceeded 50r.

Treatment of casualties.—At some stage, probably many hours or even days after a nuclear incident, casualties will be assembled at appropriate places for sorting and treatment. Most will probably be suffering from a combination of blast injuries and burns, and some will be developing radiation sickness. Many others, suffering from no more than minor degrees of shock or psychological disturbances, are likely to seek refuge in any medical establishment they can find; their admission should be strenuously resisted.

The first consideration is the sorting of casualties by types of injury and priorities of treatment, a subject upon which there is now some general agreement. The segregation and treatment of mild burns by the open or exposure method with analgesics, a simple bland ointment to ease the pain and oral electrolyte therapy may be undertaken initially by partly trained personnel. The repair of minor injuries and the light plastering of simple fractures by first-aid workers will facilitate the employment of doctors upon the more seriously wounded. Emergency treatment is especially needed for asphyxia from airway obstruction, hæmorrhage from an accessible source and visceral injuries of the chest and abdomen. Beyond these lies the whole range of traumatic surgery, each system having its own priorities. Indications for intravenous therapy must be based upon the availability of the fluids. Arrangements for decontamination, by the removal of clothing and the application of soap and water, will have to be made.

Psychiatric aspects.—The pattern of behaviour before and after impact can be anticipated with reasonable assurance, and has recently been considered by Glass (1959). The earliest phase, which prevails at the present time, is one of apathy or fatalism, or even disinterestedness. With increasing political tension, and possibly an official period of warning, stress and the feverish seeking for information are to be expected. Little is known of the immediate reaction to impact, but the subsequent 'disaster syndrome' as exemplified by the atomic attack on Japan comprised an initial phase of inertia and helplessness, followed by hysteria and aimless overactivity in an effort to escape. Abnormal reactions sometimes persisted for several months, often being followed by a sense of anger and resentment.

SUMMING UP

The scope of medical problems in nuclear warfare is both formidable and varied. A proper administrative organization and a widely disseminated knowledge of precautionary measures and first aid are the only possible means of preserving life and property. The prevailing attitude of many members of the profession is that they will be instructed, together with the public at large, in precautionary measures by intensive publicity, including broadcasting and television, as soon as a nuclear attack threatens. Much information could undoubtedly be imparted by these means in a short time, but the scheme presupposes that there will be a period of warning which is by no means certain, and it gives little opportunity to individual doctors either to refresh their knowledge of first aid or to acquaint themselves with the peculiar problems presented by thermo-nuclear casualties. As a minimum, each one of us should be able to apply reasonably skilled emergency treatment to burns and injuries of all kinds, to arrest accessible hæmorrhage and to relieve airway obstruction; an acquaintance with the simpler types of dosimeter would enable the recognition and decontamination of casualties exposed to radioactive substances to be undertaken with increased confidence. Unfortunately, the relevant information is not as readily available as it should be, although it is contained in official booklets and films and may be heard in occasional lectures. Experience suggests that this is not enough to stimulate interest, so that other means of communication must be considered, such as the issuing of pamphlets to all practitioners from time to time, regular articles in the medical press and the instruction of students.

With the nation so dependent upon the medical survivors of a nuclear attack, surely the time has come for all of us to prepare ourselves for such an emergency.

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GENERAL PRACTITIONERS' FORUM

IDIOPATHIC PARALYSIS OF THE FACIAL NERVE

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IDIOPATHIC paralysis of the facial (7th cranial) nerve of a peripheral type is generally benign and unilateral, recovery of function occurring within six months in 80 per cent. of cases (James and Russell, 1951). The remaining 20 per cent. show degeneration of the nerve with subsequent regrowth and partial recovery of function taking up to two years. This definition excludes those cases in which there is evidence of middle-ear infection, herpes, fracture or neoplasm. All age-groups are affected, although it is rarely seen in infants or the senile, and there appears to be no distinction between the sexes. The condition is said to be more common in spring and autumn.

HISTORICAL

The name of Sir Charles Bell is usually associated with this condition, on the evidence provided by his classical paper in 1821, in which he clearly differentiated, for the first time, between the motor function of the trigeminal (5th) and the 'portio dura nervi acustis' (7th) nerve.

The latter he termed the 'respiratory nerve of the face'. In this work he describes two cases of facial paralysis, one being due to tumour and the other to surgical trauma. He refers to the common occurrence of facial palsy in young people which is 'vulgarly called a blight' and which the 'physician knows is not formidable'. No cases are described, perhaps because the condition 'must be familiar to every medical observer'.

Some eight years before Bell's work, however, Richard Powell (1813) had described three cases 'where a paralytic condition of the nerves of particular parts has been induced by the operation of cold'.

These three cases constitute typical examples of facial paralysis occurring in a child, a young woman and a man. Exposure to cold some twenty-four hours before onset of paralysis is definite in two of them, and two are stated to be in good health, the third having some rheumatic pain in the chest. Recovery took place in over three months, one week, and ten days, respectively.

Powell also refers to the fact that some cases did not recover for years, and there seems no doubt that he has a prior claim to Bell in the nomenclature of the condition.

ETIOLOGY AND TREATMENT

Etiology.—The cause of idiopathic facial paralysis is unknown, although the site at which the nerve is affected is within the stylomastoid canal. Vasoconstriction of the vasa nervorum with consequent œdema, viral infection, excessive neck movements, and a localized peripheral neuritis have all been adduced as possible causes. Whatever the existing factor, there is no doubt that subsequently an œdema of the nerve develops, leading to its compression within the bony canal and producing a pressure palsy.

Treatment.—Until recently no specific therapy was available and treatment was directed to maintaining the tonus of the facial muscles by means of galvanism and massage until such time as recovery occurred. Attention has also been drawn (Barham Carter, 1952) to the importance of the electrical responses, particularly in the third week, in assessing the prognosis. Stellate ganglion block has been employed by some, and systemic corticosteroids, by virtue of their ability to reduce inflammatory œdema, have received good reports (Rothendler, 1953; Robison and Moss, 1954), though the number of cases described is limited. The variable duration of the untreated disease makes it difficult to assess the value or otherwise of specific treatment.

GENERAL PRACTICE SURVEY

Since the course of facial palsy is so variable, it was felt that many cases, if not most, were treated by their general practitioner, thereby loading the hospital series in favour of the more severe case. A more accurate picture might therefore be obtained by investigating at general practitioner level. It was also desired to gain some information on the effect, if any, of the corticosteroids given in the early stages. A pro-forma was therefore prepared, with questions so worded that cases of facial palsy due to local conditions and not truly idiopathic could be excluded by examination, and space was left for a description of the treatment employed. Cooperation was then invited from members of the research register of the Northern Home Counties Faculty of the College of General Practitioners, who were asked to notify by pro-forma all cases of facial palsy occurring in their practices. The survey was in progress for two and a half years, and during that time a total of 23 cases were fully recorded, with the assistance of 10 doctors.

RESULTS

The twenty-three cases comprised 12 males and 11 females. The males at onset had a mean age of 49 (32 to 61) years, the condition being commonest in the sixth decade (6 cases); for females the mean age was 31 (19 to 53) years, the third decade being commonest (5 cases).

So far as is known, no figures have hitherto been available to indicate the incidence of this condition, although the combined incidence of facial paralysis and trigeminal neuralgia has been estimated at 2.4 per thousand per annum (Logan and Cushion, 1958). Among the doctors cooperating in this survey, with a total of 38,000 patients at risk, the incidence was 1 case per 4,100 per annum. It was felt, however, that this figure might be unduly high in view of the method by which these doctors were selected. At the conclusion of the survey, a retrospective inquiry was therefore made among faculty members, requesting them to disclose the number of cases seen and their average list over the relevant period. To this a further fifteen doctors replied. Between them a total of 29 cases had been observed in a population at risk of 65,800. The incidence in this group was therefore 1 case per 5,700 per annum. It is considered from these findings that the true morbidity must lie between 1 in 4000 and 1 in 6000 per annum.

The seasonal distribution is shown in table I, which shows that there was no detectable seasonal influence. A history of exposure to cold, however, was obtained in seven cases (30 per cent.), and of upper respiratory infection in four cases (17 per cent.).

Prodromal symptoms described included neuralgia of the face and head, numbness of the tongue, abnormal taste, and earache. In 16 cases (69 per

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2	4	0	2	2	2	2	0	2	3	2	2

TABLE I.—Seasonal incidence of 23 cases of facial paralysis seen in general practice.

Sex	Age	Duration of paralysis (days)	Duration of treatment (days)	Total dose in mg.	Drug used
F.	19	27	9	100 225	'Hydrocort' intramuscular Prednisone
M.	41	26	9	225	Prednisone
F.	28	16	7	210	Prednisone
M.	57	24	18	900	Cortisone
M.	53	49	21	42	Prednisone
F.	20	16	10	225	Prednisone
M.	42	17	21	510	Prednisone
F.	27	28	12	120	Methylprednisolone

TABLE II.—Results of treatment with corticosteroids in eight patients with facial paralysis.

cent.) there was a latent period of from one to eight days between the appearance of prodromal symptoms and the onset of paralysis. Taste loss in the anterior two-thirds of the tongue was present in 12 cases (52 per cent.) and hyperacusis in four cases (17 per cent.). There was no evidence that the presence of either of these two signs carried a worse prognosis than their absence. Only eight patients (35 per cent.) were referred for consultant opinion, thereby confirming our initial suspicion that, in this condition at least, the general practitioner 'sees most of the game'. No bilateral or recurrent cases were reported.

Treatment.—Nine patients received corticosteroids, one (11 per cent.) of whom progressed to degeneration despite receiving treatment with adequate dosage within twenty-four hours of the onset of complete paralysis.

M.R., a male aged 57, had had chronic bronchitis and emphysema for many years, and neuralgia of the face and head for three days, followed by sudden onset of total paralysis of the right side of the face with epiphora, inability to inflate the cheeks and loss of taste over the anterior two-thirds of the tongue. Upper respiratory infection had occurred two weeks before. He was seen on the day paralysis occurred, and treatment was started at once with prednisone, 10 mg., thrice daily for five days, then tapering off 5 mg. each day to zero. He was reviewed regularly, but partial recovery, with the development of mass movements, was only apparent after one

year, and weakness was still present seventeen months after the onset, when he died from an acute exacerbation of the bronchitis with cardiac failure.

The progress of the remaining eight patients receiving treatment within a few days of the onset is summarized in table II. The mean duration of paralysis was 25.36 days (standard deviation 10.9 days).

Of the other fourteen patients, four were rejected from this analysis because of insufficient or inaccurate data concerning recovery time. The

Sex	Age	Duration of paralysis (days)
F.	40	24
M.	37	111
F.	28	15
F.	29	39
F.	53	90
F.	32	3
M.	32	120
M.	58	10
M.	56	104

TABLE III.—Duration of paralysis in nine patients with facial paralysis, who did not receive corticosteroid therapy.

ten remaining patients received no specific treatment, and one (10 per cent.) progressed to complete degeneration. The recovery time of the others is shown in table III. The mean duration of paralysis was 57.3 days (standard deviation 47.7 days).

DISCUSSION

With regard to the natural history of facial palsy, many of our findings are in agreement with the classical descriptions of the condition. The incidence was such that on average most general practitioners may expect to see one case every other year. It was surprising to find so marked a difference in the modal age between the two sexes, but with a small series this could have arisen by chance. Again, there was no evidence of a seasonal influence, nor did it appear that cases occurring in spring and autumn took longer to recover (and therefore might more possibly require consultant opinion) than did those at other seasons. Indeed the consultant referral rate was comparatively low throughout. Prodromal symptoms were common and there was often an interval of several days between their onset and the appearance of paralysis. This might be more in accordance with a virus neuritis than with a lesion due simply to cold. The incidence of degeneration was low with two cases (9 per cent.) recorded.

It has been suggested that the effect of systemic corticosteroids was worthy of investigation, and this was one of the objects of this survey. Analysis of

tables II and III gave a figure of 16.34 for the standard error of the difference which is significant at p 0.05. In view of the fact, however, that bias might be attributed, owing to the method of selection of observers, it is felt that a statistically significant difference between the two series cannot be claimed. Moreover, this form of treatment does not always prevent degeneration.

SUMMARY

An analysis is given of 23 cases of idiopathic facial paralysis seen in general practice.

The estimated incidence was 1 per 4000 to 6000 per annum at risk.

No seasonal variation in incidence was noted.

Loss of taste and hyperacusis were not found to affect prognosis, and occurred in 52 per cent. and 17 per cent. of cases, respectively.

The use of systemic corticosteroids did not prevent nerve degeneration in all patients, and the analysis of treatment with this group of drugs compared with an untreated series is inconclusive. In only two patients (9 per cent.) did the condition progress to degeneration.

I would like to express my appreciation of the help given by Drs. Wheatley, Horder, Knight, Chandler, Dennis, Newman, Rosten, Shepherd, Weller and Barber in meticulously recording the progress of their patients. I also wish to thank Dr. Barham Carter and my colleagues of the Research Committee of the Northern Home Counties faculty for their advice and encouragement, and Professor Reid for his assistance with the statistical data.

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THE TREATMENT OF GENERALIZED ARTHRITIS IN GENERAL PRACTICE

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Over a period of one year in a medium-sized, mixed, general practice in suburban Surrey, a survey was made of all patients presenting with generalized arthritis. We included in the survey all patients with symptoms and signs in two or more major joints, or one joint together with the small joints of both hands. We did not include patients with degenerative osteoarthritis in the major weight-bearing joints alone. A total of 31 patients

(26 men and five women) were included in the survey, representing 1.5 per cent. of the total practice population of 2,200. Twenty-eight were eventually classified as rheumatoid arthritis, two as generalized osteoarthritis and one as palindromic rheumatism. All were carefully assessed to find out how many were in an active phase and to endeavour to relieve their pain and improve their disability.

METHOD OF ASSESSMENT

A special appointment was made in each case when a detailed history was taken followed by a general examination. Blood was also taken for determination of the erythrocyte sedimentation rate (E.S.R.) and hæmoglobin. This initial assessment alone was therapeutic in many cases, as the patient realized that a real interest was being taken in his problem.

Determination of the E.S.R.—2 ml. of fresh venous blood is taken into a sequestrin tube and then shaken well. At leisure the blood is drawn up into a graduated E.S.R. tube which is stuck into a piece of plasticine and kept vertical for one hour. The filmy layer often seen in cases of anæmia should be included with the plasma. A reading above 12 mm. is regarded as abnormal.

The most surprising factor emerging from this preliminary examination was the high proportion of patients with severe chronic arthritis who had a raised E.S.R. These 13 patients had all had their symptoms for between five and forty years and had been regarded as inactive cases ('burnt-out' rheumatism) but no less than 10 had an E.S.R. above normal; six of these were over 70 years of age.

CLASSIFICATION

The E.S.R. was used to divide patients into two groups: (1) active rheumatism (12 patients); (2) slightly active or inactive rheumatism (19 patients).

Group 1. *Raised E.S.R.* (*active rheumatism*).—Of the twelve patients in this group nine were women and three were men. One patient had only recently shown evidence of arthritis and it was therefore not surprising that she had a raised E.S.R. Another had an obvious exacerbation. The other 10 patients were all long-standing cases, mostly deformed, and the proof of activity in these patients was most unexpected. Many of them had osteoarthritis of the knees or hips, together with signs in other joints and their arthritis had been regarded previously as mainly degenerative. Careful assessment revealed, however, that most of them were suffering from a rheumatoid type of arthritis, with superimposed degenerative changes. All were helped by treatment—some dramatically.

Mrs. T., the only case of early active rheumatism seen during the year, walked into the surgery with a two months' history of joint pain. The E.S.R. of 60 came as a surprise and as a result she was put to bed and given salicylates. In two weeks her E.S.R. had fallen to 20 and she was allowed up. After two further months of increasing activity she was clinically cured and has remained free of symptoms for twelve months. It is felt that without the bed rest the process might have dragged on for many months or even years.

Group 2. *Normal E.S.R.* (*slightly active or inactive rheumatism*).—This group was divided into three sub-groups.

Minimal evidence of arthritis with superimposed tension pain.—Four women and one man comprised this sub-group and their symptoms of rheumatic-type pain were thought to be due largely to tension or somatic manifestations of anxiety states. They all had genuine mild arthritis but it was felt that they presented themselves mainly because their pain and discomfort were increased by tension. Many patients with arthritis never bother to consult a doctor.

In a survey at Leigh, for instance, 38 per cent. of all females with rheumatoid arthritis and 19 per cent. of males had not consulted their family doctors (Kellgren *et al.*, 1953).

The women were helped by simple psychotherapy and anodynes or tranquillizers. The man was possibly a near-malingerer but appeared to be helped by phenylbutazone.

Mild or moderate arthritis.—There were 10 women and one man in this group. None of these patients derived the dramatic benefit which some of those with a raised E.S.R. obtained, but all were helped by rest, physiotherapy, analgesics, iron, hydroxychloroquine sulphate or the passage of time. The man is probably a case of palindromic rheumatism and appears to have been helped by phenylbutazone. There were two cases of true generalized osteoarthritis.

'Burnt-out' arthritis.—The three patients in this group, all women, were practically house bound with gross deformity. One was probably a case of generalized osteoarthritis and the other two had degenerative, as well as rheumatoid, disease. One was referred to a hospital geriatric department and was helped slightly by physiotherapy and steroids. Howell (1960) finds that some of this type are helped by steroids. Attention to their general health and the genuine interest shown helped the others to cope with their disability.

SPECIFIC TREATMENT

Hydroxychloroquine (*'plaquenil'*).—In 1951, Page noticed improvement in the rheumatoid arthritis of patients being treated with mepacrine for discoid lupus. From 1956 onwards reports appeared showing that the less toxic chloroquine had a good effect in most cases of rheumatoid arthritis.

In a double-blind trial on patients with long-standing smouldering activity, Bagnall (1957) found that 12 out of 19 derived major benefit or went into remission, whilst none out of 12 did so on placebo tablets. Scherbel and his colleagues (1958) found major improvement or remission in over 60 per cent. of 60 cases treated with hydroxychloroquine, which is less toxic than chloroquine. In particular, of the 26 cases with histories of between two and eighteen years, all with joint deformity and extensive muscle atrophy, four went into remission and another 11 derived major improvement. In this country Kersley and Palin (1959) found that of 10 patients given 800 mg. of hydroxychloroquine daily, five were much improved and the other five derived benefit. They pointed out, however, that corneal opacities occurred in a large proportion of patients, being detected by the slit lamp in many cases before symptoms developed. Although they regressed after the drug was stopped, other workers have reported cases of retinopathy with probable irreversible changes (Hobbs *et al.*, 1959).

Patients on hydroxychloroquine should therefore be referred for an ophthalmic surgeon's opinion after six months, and kept under his supervision.

In this series hydroxychloroquine was used in the recommended initial dosage of 800 mg. daily on 12 patients with long-standing rheumatoid arthritis: one developed an allergic skin reaction and administration was stopped, whilst two had treatment for less than two months. Among the remaining nine patients who completed at least two months' treatment, four were greatly improved and three slightly improved. One patient died of an unrelated condition but four of the other six who responded to treatment are still taking the drug. As in previous series, improvement did not begin until the second or third month.

These results were considered to be encouraging, although the series is a small one, as these patients had been in a stable condition for many years and spontaneous remission was most unlikely.

Phenylbutazone.—This was not used in many cases as we were particularly interested in trying the effect of hydroxychloroquine on as many patients as possible. When used, dosage started with 100 mg. four times daily and treatment was stopped if there was no amelioration of symptoms within one week. If pain was relieved, 100 mg. thrice daily was used for a further week and then 100 mg. twice daily for maintenance. Seven patients were treated, of whom two were poorly selected as their symptoms were mainly due to stress. One patient had to stop the drug owing to vomiting, after initial improvement. Of the remaining four, the response was excellent in one (after failure of hydroxychloroquine), moderate in one and fair in two.

Steroids.—Dexamethasone, 0.5 mg. thrice daily, was the routine initial treatment used for the three cases treated by us, the fourth being given prednisolone at a hospital outpatient department. All three had shown little or no improvement previously from phenylbutazone and one had had hydroxychloroquine as well without effect. All were more or less housebound by pain or disability. Following initial improvement they were all, for various reasons, transferred to prednisolone. All are still taking small doses and have maintained their improvement.

Mrs. C., aged 58, started to walk unaided from her bed to her chair for the first time for many years soon after she started dexamethasone, but unfortunately developed gastric irritation. A few weeks after dexamethasone had finally been discontinued she started on 10 mg. daily of enteric-coated prednisolone. This produced a similar clinical response to the 1.5 mg. of dexamethasone, and there was no gastric irritation after six months. Hydroxychloroquine was then taken in addition for nearly three months, but relapse occurred immediately after weaning from the prednisolone. Treatment with the latter was therefore reinstituted.

Mrs. B., aged 70, lost her pain almost entirely and was able to do much more around the house. She also regained her pre-rheumatoid euphoria. Her long-standing œdema could not be controlled, however, and a change was made to prednisolone, but without any additional benefit.

Mrs. N. S., aged 64, is now walking happily to surgery. While on dexamethasone she gained 20 pounds (9 kg.) in weight in eight months, and this could not be controlled by either diet or diuretics during the subsequent four months. A change to prednisolone resulted in a weight loss of 5 pounds (2.3 kg.) without any other change in routine. She was partly controlled by hydroxychloroquine, 800 mg. daily, but has been changed back to prednisolone.

Physiotherapy.—The aim of physiotherapy is to relieve pain or to help

to restore function. During this survey only two patients appeared to need physiotherapy as pain was relieved adequately by other means in the remainder. Most patients with rheumatism are desperately keen to increase the range of their activities and, if pain is relieved, seem able to do so by their own active exertions. Those who improved would not, we feel, have progressed faster with the aid of physiotherapy. Conversely, two patients who were attending specialized rheumatic physiotherapy departments at the start of the survey have improved greatly with hydroxychloroquine and steroids respectively, and have not wished to re-attend. Our experience leads us to believe that many routine physiotherapy attendances do not justify the time and expense or the inconvenience to the patient. Physiotherapy departments are of most use in relieving pain in cases of 'burnt-out' arthritis and in restoring function in special cases, especially those learning to walk again.

DISCUSSION

The discovery of a raised E.S.R. in so many of the old chronic patients meant that they could be offered active therapy. We found it impossible to tell clinically which of them were suffering from an active rheumatic process, and which were 'burnt-out', so that the simple E.S.R. estimation was invaluable.

Of those 'chronics' with a raised E.S.R. one died before treatment could be started. Five of the remaining nine have derived good or moderate improvement from hydroxychloroquine, and three from steroids in small doses, whilst one is not appreciably improved. The time and trouble spent on these patients was therefore well worth while, and the treatment of the chronic cases gave much satisfaction, especially as most of them had borne their disabilities with fortitude. Greater understanding of them and their problems led to an affectionate doctor-patient relationship in many cases. Hydroxychloroquine appears to be a valuable addition to our therapeutic armamentarium for the patient with chronic rheumatoid arthritis and may well have an effect on the actual disease process rather than a symptomatic effect comparable to cortisone.

We suggest the following plan of treatment for patients presenting in general practice with generalized arthritis:—

Early active cases with raised E.S.R.—Bed rest and salicylates until the E.S.R. approaches normal, and then gradually increasing activity. If no response refer to hospital.

Early cases with normal E.S.R.—Modified rest and salicylates. Search for sources of tension. Strong reassurance that the rheumatism is mild and is not likely to lead to crippling.

Cases of one to five years' duration with raised E.S.R.—Modified rest and salicylates. If no improvement, phenylbutazone or hydroxychloroquine. Steroids in selected severe cases, after radiograph of chest, blood-pressure estimation and urine test.

Chronic cases with raised E.S.R.—Hydroxychloroquine and modified rest. Phenylbutazone concurrently if necessary. If no response after two months, steroids. Physiotherapy if necessary to consolidate improvement.

SUMMARY

(1) Thirty-one patients with generalized arthritis presenting during the course of one year in an average-sized general practice were investigated and treated. Twenty-eight were eventually classified as mainly rheumatoid in type. The determination of the E.S.R. was found to be an essential preliminary to the correct assessment of these patients.

(2) Many of the milder cases with a normal E.S.R. had stress factors in addition to their rheumatism and it is thought that the fact that they were under stress caused them to bring their physical complaint to the doctor, as it is known that many patients with mild rheumatism never consult their doctors.

(3) Thirteen patients had a history of severe pain and disability lasting for more than five years and most of them were regarded clinically as cases of inactive or 'burnt-out' rheumatism. Ten of them, however, had a raised E.S.R. One died before treatment could be started and one had a reaction to hydroxychloroquine, but the remaining eight showed considerable improvement with either hydroxychloroquine or a small dose of steroids and all are still on treatment. Four of these eight are over seventy so that age is no barrier to successful investigation and treatment.

(4) Hydroxychloroquine administered for two months or longer appeared to have a specific effect both in restoring function and in lowering the E.S.R. in seven out of nine chronic patients whose symptoms had been the same for many years and in whom spontaneous remission was most unlikely. It appears to merit an extended trial in general practice.

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CAT-SCRATCH DISEASE IN TWO BROTHERS

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Cat-scratch disease is being diagnosed with increasing frequency since it was first recognized as an entity in 1932. It is an infection caused by a virus of the psittacosis-lymphogranuloma venereum group and normally contracted after a cat scratch, the cat acting as a vector. Full descriptions and reviews have been made in recent years in the United States (Spaulding and Hennessy, 1960) and in this country (Cox, 1954; Brand and Finkel, 1956; Hinden, 1957). The British reports describe hospital patients and problems in diagnosis are discussed.

The following case reports are of two cases seen in general practice, one complicated by erythema nodosum.

CASE RECORDS

Case 1.—Gary H., aged seven, complained on October 28, 1960, of a swelling of the right side of his neck for one day. On examination there was an enlarged, firm, tender right upper cervical gland measuring 4.5 by 3.5 cm. His temperature was 100° F. (37.8° C.), the throat was normal and there was no other clinical abnormality. It was thought that the diagnosis was infective lymphadenitis and phenoxymethylpenicillin was prescribed. The next day he felt unwell, his temperature was 101.4° F. (38.5° C.), the gland was more tender and the skin over it was red. Penicillin was replaced by tetracycline (he had a five-day course).

FIG. 1.

FIG. 2.

FIG. 1.—Cat-scratch disease: Gary H., November 11, 1960.

FIG. 2.—Cat-scratch disease: Anthony H., November 10, 1960.

Two days later his temperature was 99° F. (37.2° C.) and the redness over the gland had subsided but the gland was still as enlarged and tender as before. That evening his brother was also seen (see case 2) and during the next few days much thought was given to the differential diagnosis. Cat-scratch disease was considered and the history was then obtained that the family had acquired a young kitten two months before. The patient played with him every day and had received many scratches. On examination a scratch was found on each side of the neck but none were visible elsewhere. Cat-scratch antigen was obtained and the patient was tested on November 9. The result was positive: papule 0.8 cm., surrounded by an area of erythema 4 by 3 cm.

On November 11 the temperature had been normal for a week but the gland was still enlarged and tender. He had now also developed a swelling of his left submandibular gland (fig. 1). The next day the temperature rose to 100° F. (37.8° C.) and he had typical erythema nodosum of both legs. A Mantoux test was carried out and was negative. The rash and pyrexia lasted five days. During the next few weeks the right gland subsided but the left gland became larger and eventually fluctuant and a small quantity of sterile pus was aspirated on December 8.

Case 2 (fig. 2).—Anthony H., aged eight, only brother of the first patient, was seen on October 31, 1960, when he complained of swelling of the right side of his face for three days. He had been staying with a relative for the weekend. On examination, the right submandibular gland was enlarged and tender (3 by 1.75 cm.) On the right cheek there was a small slightly crusted papule. The left submandibular gland was also palpable and his temperature was 99° F. (37.2° C.). As his brother had appeared to improve with tetracycline he was also given a five-day course.

The appearance of the papule and the lymphadenitis, associated with the history of cat scratches subsequently obtained, led to the patient being skin tested with antigen on November 7, and the result was positive: papule 0.7 cm., raised erythema 4 by 3 cm. The Mantoux test was negative.

In less than three weeks the papule was healed and the glands were much smaller and not tender.

Mrs. H. had an indolent papule on her lower lip, but the skin test was negative and the lesion healed without treatment in ten days.

SUMMARY

Cat-scratch disease, occurring in two brothers concurrently, is described. The diagnosis was suggested on clinical grounds and confirmed by intradermal testing. Both children had marked lymphadenitis. One child had a typical papule on his face and the other case was complicated by erythema nodosum.

The illness should be considered in the differential diagnosis of unusual lymphadenitis and if there is a history of a cat scratch, skin testing for cat-scratch disease is indicated. The clinical appearance (and indeed the histological appearance) of the enlarged glands may be very similar to tuberculous glands, and a positive tuberculin test may be due to previous BCG vaccination or primary infection.

It is extremely doubtful whether tetracycline had any effect on the course of the disease, although it appeared to improve one case originally.

The children's parents willingly destroyed the kitten. Difficulties might arise when the family do not own the culprit animal.

Cat-scratch disease can be diagnosed and treated in general practice. Complications may require hospital treatment in some cases.

I have to thank the Central Public Health Laboratory, Colindale, for supplies of antigen, Dr. J. Burke, senior pædiatric registrar of the Whittington Hospital, for reading the typescript and making helpful suggestions, and Dr. A. Rinsler, who took the photographs.

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CLINICAL TRIAL OF AN ANTISEPTIC LOZENGE

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The problems of treating common infections of the mouth and throat are well known to all practitioners. The not uncommon occurrence of glossophytia ('black tongue'), digestive disorders, and also the danger of the more serious *Monilia albicans*—arising from disturbances of normal mouth and intestinal flora following the use of lozenges containing antibiotics—has made one reluctant to prescribe these agents. It is for this reason that I am now reporting my clinical impressions of a new oral chemical antiseptic, ambazone ('iversal').

Ambazone was discovered as a result of investigations carried out on quinone derivatives by Professor G. Domagk. Its chemical formula is 1:4-benzoquinone aminohydrazine thiosemicarbazone hydrate and it is supplied as chocolate-flavoured lozenges of 10 mg. According to the manufacturers, it inhibits growth of haemolytic streptococci and pneumococci at dilutions up to 1 part in a million. Against β-haemolytic streptococci (group A), the effect is apparent at 1 in 10 millions, and against *Strept. viridans* at 1 in 8 millions. It is effective in the presence of pus, and there are said to have been no reports of sensitization.

SCOPE OF INVESTIGATION

In the winter of 1959-60 I used ambazone in the most severe cases of tonsillitis and mouth infections occurring in the Leeds Police Force. Altogether, 56 policemen were treated with one course of ambazone (5 lozenges daily for three days). No other treatment was prescribed.

RESULTS

Suppurative tonsillitis (12 *cases*).—Seven patients reported that they could swallow without pain after the first day of treatment. Soreness disappeared in the remainder by the third day. All tonsils were clean when examined on completion of the course.

Ulcerative stomatitis (12 *cases*).—Rapid clearance of the ulcers occurred in eight cases. Four failed to respond.

Post-tonsillectomy cases (6 *cases*).—All healed in a much shorter time than normally expected, with no inflammation or infection.

Simple pharyngitis (15 *cases*).—Twelve patients reported rapid relief of soreness shortly after starting the course. All were symptom free on completion. Three cases failed to respond and developed nasal colds.

Post-nasal tonsillitis (10 *cases*).—In eight cases the prompt relief of soreness was very apparent and the infection cleared rapidly within the three days of treatment. Two cases failed to respond and developed influenza.

Burnt throat (*from hot potato*) (1 *case*).—The throat had become inflamed and very sore, but there was rapid clearance within three days.

These results were compared with the results obtained in similar cases which occurred during the previous winter. In these cases, antibiotic lozenges were at first prescribed, but abandoned when two patients developed 'black tongue'. Initial treatment with lozenges containing a quaternary ammonium compound was then tried, but the majority of patients failed to respond and in a considerable number the infection developed with high temperature, and systemic penicillin was resorted to.

SUMMARY

Because of the undesirability of using local antibiotics or systemic penicillin in the treatment of common mouth and pharyngeal infections, a new oral chemical antiseptic (ambazone) was used in 56 severe cases (including 12 cases of suppurative tonsillitis, and 12 cases of ulcerative stomatitis). A total of nine patients failed to respond and five of these developed nasal colds or influenza. The remaining 47 all showed complete clearance of the infection within three days, with rapid disappearance of soreness.

There was no evidence of sensitization, and no symptoms arising from the destruction of normal mouth and intestinal flora were observed.

It is emphasized that this is a report of clinical impressions, but it is felt that an oral chemical antiseptic which promises to be highly effective in rapidly and safely clearing common mouth and throat infections, is worthy of note and of the facilities of fuller independent investigation.

GENERAL PRACTITIONER CLINICAL TRIALS

VARIATIONS OF A COUGH SYRUP

IT has been suggested that the addition of antihistamine drugs to either cough suppressants or expectorants may enhance the effectiveness of the latter drugs. In this trial, it was decided to compare a plain cough syrup ('pectamol') containing oxeladin citrate, 10 mg. per 5 ml., with the same syrup to which had been added an antihistamine (methdilazine, 'dilosyn'), 2.5 mg. per 5 ml., and with a third syrup containing the antihistamine as before added to an expectorant mixture consisting of: ammonium chloride 100 mg., sodium citrate 50 mg., per 5 ml.

SCOPE OF INVESTIGATION

The three syrups were supplied in identical bottles, being distinguished only by the letters A, B and C, and these were given in alphabetical order to successive patients attending the eight participating doctors, with coughs due to any cause. The dose for each formulation was standardized at 10 ml. thrice daily.

In all, 199 patients were treated, with a very slight preponderance of female cases; the majority were in the 31-60 years age-group. The three treatment groups were evenly distributed throughout the different age-sex groups. Acute conditions outnumbered chronic conditions by 5.5 : 1 and the coughs due to coryza and acute tracheitis were the commonest conditions treated, closely followed by the coughs due to influenza and acute bronchitis. Cough due to chronic bronchitis was the commonest chronic condition treated. The different conditions treated were also evenly distributed in the three treatment groups, with the exception of acute tracheitis: twice as many patients with tracheitis were treated with mixture C as with mixtures A and B. Previous treatments had been given to 73 per cent. of the patients, but the remainder had not previously been treated. Codeine linctus B.P.C. was by far the most popular previous treatment and 48 per cent. of patients had obtained complete relief of cough, 43 per cent. partial relief and 9 per cent no relief, with this preparation.

RESULTS

The results so far as the cough is concerned are shown in table I, from which it is seen that there is no appreciable difference in the relief of cough between the plain cough syrup and the cough syrup with the added antihistamine, and that the antihistamine-expectorant syrup was not quite as good as the other two preparations in relieving cough. The results were also assessed in relation to the underlying causes of the coughs, and in the

acute conditions treated the results were similar to the over-all picture. In the chronic conditions, however, there was a relatively better response to the plain cough syrup than to the other two mixtures, the response to mixture B (with added antihistamine) being somewhat poorer relatively

	(A) Oxeladin			(B) Oxeladin + antihistamine			(C) Antihistamine + expectorant		
	+	±	−	+	±	−	+	±	−
Dr. A	5	4	1	4	6	−	7	3	1
Dr. B	8	1	2	9	1	−	7	4	1
Dr. C	4	2	−	2	2	1	4	−	1
Dr. D	1	1	1	−	3	−	2	1	−
Dr. E	5	2	1	2	3	3	4	2	2
Dr. F	2	3	3	3	2	1	2	1	3
Drs. G & H	12	7	3	12	9	3	6	6	7*
Totals	37 (54%)	20 (29%)	11 (17%)	32 (49%)	26 (39%)	8 (12%)	32 (50%)	17 (27%)	15* (23%)

+ = complete relief. ± = partial relief. − = no effect.
*One patient omitted treatment before assessment could be made.
TABLE I.—Effect of three mixtures on incidence of cough in 199 patients.

than in the acute cases. The results were also analysed in relation to the duration of the cough before treatment was started and to the duration of treatment. Coughs of longer duration tended to respond no better than conditions of shorter duration, so spontaneous remission of symptoms was probably not an important factor in the results of this trial. The majority of the conditions treated had been present a short time, of up to ten days' duration, and most patients were treated for five to ten days, there being

Acceptability	No. of patients		
	A	B	C
Very good	13	10	10
Moderately good	42	47	36
Not very good	8	5	7
Very unpleasant	5	4	12

TABLE II.—Patient acceptability of three cough mixtures.

little difference in the results obtained when treatment was for either a shorter or a longer period than this.

The participants were also asked to record comments made by the patients on the pleasantness or otherwise of the various mixtures, and these results are shown in table II. If the patients finding the preparations very good and moderately good are added together, and compared with those

finding the preparations not very good or very unpleasant, it will be seen that preparation A was acceptable to 55 patients (81 per cent.), preparation B was acceptable to 57 patients (85 per cent.) and preparation C was acceptable to 46 patients (71 per cent.). The antihistamine-expectorant mixture was most disliked, mainly because it was either too sweet, nauseating or had an unpleasant taste. Improved expectoration was reported by two patients on mixture A, one patient on mixture B and one patient on mixture C, but little significance can be attached to this observation.

Side-effects were minimal and no side-effects at all were complained of by 92 per cent. of patients on mixture A, 94 per cent. on B and 92 per cent. on C. More than one syrup was given to 38 of the patients in this trial, at different times, and the preferences recorded. These showed that there was nothing to choose between mixtures A and B, but that both A and B were considerably preferred to mixture C.

CONCLUSIONS

The main conclusion to be drawn from this trial is that the addition of an antihistamine to the plain oxeladin cough syrup does little to enhance the usefulness of the latter as a cough suppressant, and that the expectorant-antihistamine mixture was definitely somewhat inferior to the other two syrups, both in effectiveness and palatability. The added antihistamine might have been expected to benefit cases of acute coryza, but the addition did not in fact improve the results in this condition, and neither did the added expectorant in cases of chronic bronchitis. It was noted that the previous results recorded with codeine linctus were little different from the over-all results obtained in this trial.

The following took part in this investigation:—
Dr. B. Bisley, Twickenham, Middlesex
Dr. J. Fishman, Morden, Surrey
Dr. W. Gillies, Moffat, Dumfriesshire
Dr. L. J. Ison, Morden, Surrey
Dr. J. C. Merry, Exeter, Devon
Dr. Nancy Smith, Darwen, Lancashire
Dr. R. Tepper, Crawley, Sussex
Dr. D. Wheatley, Twickenham, Middlesex
This is Report No. 14 of the General Practitioner Research Group.

A MULTI-INGREDIENT TABLET FOR THE SYMPTOMATIC RELIEF OF THE COMMON COLD

LAST winter a number of preparations containing several ingredients were made available for the relief of the various symptoms associated with acute coryza. Although the compound tablet which was evaluated in this trial is

not available in this country, many similar preparations are, and it was therefore considered worth while recording our results with this preparation. The preparation is designated V.185-15 and contains:—

Salicylamide	0.162 g.
Phenacetin	0.162 g.
Ephedrine	0.004 g.
Caffeine	0.016 g.
Carbinoxamine (an antihistamine)	0.002 g.

These ingredients were contained in one tablet and the dose advocated is 2 tablets three or four times daily.

SCOPE OF INVESTIGATION

A total of 48 patients was studied, male and female patients being almost equal in numbers, with the main incidence in the male cases in the 31 to 60 years age-group, and in the female cases in the 11 to 30 years age-group. The reason for this age difference was not quite apparent, but it might be conjectured that the 11 to 30 years female group contains more women at work before they get married, than the older female groups, and that patients who are working are more likely to come to the doctor when they catch a cold, than patients who are at home anyway. Just over 50 per cent. of these patients usually suffered one to two attacks per winter, and 15 per cent. of them suffered from frequent attacks (6 to 10 per winter). The majority of the patients (61 per cent.) usually suffered from colds which lasted from one to two weeks. These therefore represented a suitable group for a trial of a symptomatic remedy, since their symptoms were of sufficiently long duration to obviate the likelihood of spontaneous remission. The majority (69 per cent.) had been treated with other symptomatic remedies, of the analgesic type, on previous occasions, but the results had not been entirely satisfactory since only 15 per cent. reported having obtained complete relief of symptoms, 73 per cent. partial relief and 12 per cent. no relief. Nearly three-quarters of the patients in the trial were treated with V.185-15 within four days of the onset of the cold, and this was particularly so in the case of patients whose symptoms usually persisted for one to two weeks.

RESULTS

It was found that there was virtually no difference between the average time taken for the colds to resolve in the present trial, as compared with previous experience, and indeed this had not been expected. The main interest in the results is centred on the relief of the various symptoms accompanying the cold, and these are recorded in table I. It is seen that V.185-15 proved to be quite satisfactory in relieving symptoms and over half the patients obtained complete relief of general malaise. With regard to individual symptoms, V.185-15 was most effective in relieving rhinorrhœa (60 per cent. complete relief, 22 per cent. partial relief, 18 per cent.

no relief). For sneezing and headache the figures were virtually the same (52 per cent. complete relief, 14 to 17 per cent. partial relief, 31 to 34 per cent. no relief). The results were poorest in the relief of cough, as would be expected since no cough suppressant is included in the tablet, and only 16 per cent. of patients obtained complete relief of this symptom, with 10 per cent. obtaining partial relief and 74 per cent. obtaining no relief.

Symptoms	Complete relief	Partial relief	No effect	None
Malaise	27 (56%)	7 (15%)	14 (29%)	–
Rhinorrhœa	27 (60%)	10 (22%)	8 (18%)	3
Sneezing	22 (52%)	6 (14%)	14 (34%)	6
Headache	19 (52%)	6 (17%)	11 (31%)	12
Cough	5 (16%)	3 (10%)	23 (74%)	17

TABLE I.—Effect of trial tablet on symptoms of the common cold in 48 patients.

The results from the different practices were generally similar, and were also similar in the group of patients with long duration of symptoms.

Side-effects were few and 81 per cent. of patients experienced none at all, the others complaining of slight lassitude, sleepiness and dizziness. These were not severe enough to necessitate omission of treatment in any case.

CONCLUSIONS

It was concluded that V.185-15 is quite an effective symptomatic remedy for the common cold, and that the contained antihistamine and ephedrine did appear to have some specific effect on rhinorrhœa and sneezing. Nevertheless, the participating doctors felt that very often a standard compound analgesic tablet might suffice for symptomatic treatment.

The following doctors took part in this investigation:—
Dr. B. Bisley, Twickenham, Middlesex
Dr. S. E. Ellison, London, N.W.6
Dr. J. S. Gregory, Sheffield
Dr. T. P. McB. Kelly, Coleraine, Northern Ireland
Dr. B. R. Middleton, nr. Wallsall, Staffordshire
Dr. D. Wheatley, Twickenham, Middlesex
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CURRENT THERAPEUTICS

CLXV.—THE TREATMENT OF PAIN BY ETHYL CHLORIDE AND OTHER COOLING SPRAYS

By MAURICE ELLIS, M.B., F.R.C.S.

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MANY writers in the past fifty years have drawn attention to the value of spraying the skin with ethyl chloride in the treatment of pain, but only temporary interest was roused in the subject. Just under ten years ago, my attention was drawn by Dr. W. A. Bain, at that time Professor of Pharmacology in the University of Leeds, to a report by Travell (1952) demonstrating the value of this cold spray in the treatment of acute wry neck. The ethyl chloride spray has been used in the casualty department of the General Infirmary at Leeds ever since. Over the years, an increasing number of painful conditions has been found to respond to treatment in this way and the ethyl chloride spray has been accepted as a valuable addition to the therapeutic armoury of the department (Ellis, 1956, 1961).

RATIONALE

The thawing of the skin after freezing by ethyl chloride is usually attended by exquisite pain and this is probably the reason that the treatment fell into abeyance after the earlier reports. The trigger points described by Travell are scarcely applicable in renal colic, in which ethyl chloride produces one of its most dramatic effects. The conclusion that we have reached is that treatment by the cold spray of ethyl chloride is, in fact, a particularly effective form of counter-irritation. The central nervous system is bombarded with a barrage of cold impulses to such a degree that the pain impulses are blotted out. If the skin is frozen, cold impulses will no longer be generated, but the pain produced in the thawing process may also be a form of counter-irritation and account for the successes achieved by freezing. This empirical theory of counter-irritation by the cold spray gives an explanation of the successes and the failures in treatment by the spray.

TECHNIQUE OF SPRAYING

If we accept that the rationale of the cold spray is counter-irritation, then the counter-irritation should be adequate. A short 'squirt' from the bottle is not sufficient. On the other hand, prolonged spraying to the point of freezing and anæsthesia is not indicated, for this may produce a 'cold' burn of the skin. The spray can be continued for about twenty seconds, stopping as soon as any suggestion of frost appears. Another method is repeated

sprays for a few seconds, with some ten seconds between each. In conditions like renal colic, one-third to one-half of a bottle is used.

CHOICE OF PREPARATION

The practical disadvantage of ethyl chloride is that it is flammable and toxic. This may not be important when it is being used by a doctor or under direct medical supervision, but for patients to use or keep such a substance in their own homes is not without danger. There are now available, however, mixtures of fluoromethanes (e.g. 'P.R. spray', 'skefron'), which are equally effective cooling agents but are non-flammable and non-toxic. They are supplied in pressurized containers and can be safely allowed into the hands of lay people for self-treatment of pain in their own homes.

INDICATIONS

The types of pain relieved by the use of ethyl chloride or similar cooling sprays can be divided into three groups:

(a) *Those in which there is some element of spasm:*
- Acute wry neck
- Acute lumbago
- Renal colic
- Spasmodic dysmenorrhœa
- Muscle cramps, including those occurring in sport and night cramps in muscle
- Possibly coronary thrombosis

(b) *Those in which there is a pain cycle initiated by some undetermined factor:*
- Migraine
- Post-herpetic neuralgia
- Trigeminal neuralgia
- Muscle pains of obscure origin

(c) *Those in which there is an exacerbation of pain from some chronic condition:*
- Chronic arthritis
- Fibrositis
- Painful scars and causalgia
- Persistent pain following fractured ribs
- Low back pain
- Tennis elbow

In the first two groups, the effect of adequate spraying is usually quite dramatic.

RESULTS

Acute wry neck.—These cases are not uncommon. Typically, the patient in getting out of bed in the morning or during dressing, jerks the neck and severe pain is felt down one side of the neck. By keeping the chin pointed to the affected side, the pain is relieved. Any attempt to move the chin to the mid-line causes pain and spasm of all the muscles of the neck on that side, particularly the sterno-mastoid. A spray all down the affected side of the neck causes a relaxation of the spasm and the doctor or the patient can now move the chin to the opposite side with only trivial symptoms. One

spray is often sufficient for complete cure but a residuum of pain and spasm may persist which a further spray the following day will abolish.

Acute lumbago.—The acute low back pain coming on abruptly while bending or lifting heavy weights with the back flexed is well known. Examination of the back shows a scoliosis and complete loss of lordosis. A vigorous spray of the lumbar region with the patient lying prone produces dramatic results. Usually the curve of the normal lumbar lordosis reforms under the doctor's eyes. For general practitioners who are called to see such patients lying in bed in their own homes, such treatment is usually dramatic.

Renal colic.—The value of the spray in this condition was first discovered in Leeds. Many of the patients had been treated with morphine, pethidine, atropine, and propantheline in varying combinations without real success. A vigorous spray from the renal angle down to the pubes has never failed to produce immediate relief of the pain. If, in fact, the pain is not relieved, the diagnosis of renal colic is open to doubt: one pethidine addict was discovered by alleged failure of relief of pain, and one twisted ovarian cyst was also discovered.

Spasmodic dysmenorrhœa.—The type of dysmenorrhœa producing violent colic, with gross distress to the patient, usually on the first day of the period, is quickly and dramatically relieved by a vigorous spraying of the hypogastrium. Five minutes after the spray, a girl who has been sick and crippled by her pain can go away completely relieved.

Muscle cramps.—The violent cramp in the calf muscles often occurring during games can be relieved immediately by the spray. In addition, the painful muscle cramps occurring in the legs, while the patient is in bed at night, are effectively abolished by the cold spray. Many people have expressed gratitude for the relief obtained in this unpleasant condition which no previous treatment had been able to give.

Coronary thrombosis.—It has been reported to me that in a number of cases of coronary thrombosis, the severe precordial pain has been relieved by spraying the precordium. Physicians may think such treatment worth while, but, as a surgeon, I do not feel competent to advise on this.

Migraine.—Spraying the temporal region in the early stages of migraine produces a gratifying cessation of the attack. A number of chronic sufferers from this condition in this area keep a bottle of ethyl chloride always available, as they have found it more efficacious than any drugs previously used.

Post-herpetic neuralgia.—The use of the spray in this condition has nearly always produced complete relief after two or three treatments. Many of the patients have previously used various analgesics for the pain without much relief. Following one or a few spray treatments, pain usually disappeared and did not recur.

Trigeminal neuralgia.—Substantial relief is obtained in many cases of this

condition. A course of spray treatment is strongly recommended before operation on the nerves is considered.

Pain associated with chronic arthritis.—Spraying of the joints in various forms of chronic arthritis does produce relief of pain. It is too much to hope that relief will be permanent, but many sufferers of longstanding have expressed gratitude for this additional method of relieving their pain.

Fibrositis.—Although many doubts have been expressed that this is a clinical entity, pains in muscles and fasciæ do occur and are relieved by the cold spray over the area of pain.

Painful scars and causalgia.—The first case I treated with ethyl chloride was a scarred painful finger with limitation of movement. The symptoms had been present for some months and one treatment by the cold spray produced immediate and lasting relief of pain, together with full movement.

Late pain following fractured ribs.—The cold spray produces only a short period of relief of pain in the early days following rib injuries, but in the later days following the injury the cold spray over the affected ribs is very effective in abolishing the pain.

Low back pain.—Although the dramatic relief of pain produced by the spray in acute lumbago is not equalled in chronic low back pain, repeated spraying does produce relief in the majority of cases.

DISCUSSION

The treatment of these conditions by means of the cold spray is, of course, purely symptomatic. It should not be claimed that we are treating the cause of the condition. In many of these conditions, however, an essential part of the treatment is rest. Acute lumbago and severe chronic low back pain do require rest in bed as part of their treatment. It is one of the virtues of the cold spray that with the abolition of acute pain, the patient can rest and relax in bed for whatever number of days is considered essential for the condition. In renal colic the cause of the condition is usually a minute calculus. As is well known, many of these calculi pass without surgical intervention. During the passage of these stones to the outside, there may be recurring attacks of colic which the cold spray can relieve so dramatically. In the treatment of fibrositic and arthritic pain, the cause of which is really unknown, the cold spray is a valuable addition to the other methods which have been used for the relief of the pain. In such chronic conditions it will be found valuable if the cold spray is alternated with warmth from an infra-red lamp or short-wave diathermy. Since the patient can often use this cold spray in his own home, visits to hospital for treatment in the physiotherapy department can be reduced in number.

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CALLING THE LABORATORY

XXI.—LABORATORY TESTS IN THE DIAGNOSIS OF VENEREAL DISEASE

By A. E. WILKINSON, M.B., B.S.

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LABORATORY investigations play an important part in the diagnosis of all the venereal diseases and the practitioner treating these conditions must make full use of the laboratory if his management of a case is to be efficient.

SYPHILIS

In primary and secondary syphilis the demonstration of *T.pallidum* in the lesions by dark-field microscopy establishes the diagnosis with certainty. As examination of several specimens may be required, the patient should attend the laboratory; no treatment, local or general, should be given before the tests are performed.

SERUM TESTS

In early and late symptomatic syphilis, serum tests are used to confirm the diagnosis. In the latent stage of the infection, the diagnosis is made on serological grounds alone. Both a Wassermann and a flocculation test, such as the Kahn test or Price's precipitation reaction, should be performed and it is desirable that one of these should be quantitative to act as a baseline for assessing the effect of treatment. These tests detect an antibody, 'reagin', which first appears during the primary stage of the disease. They are not immunologically specific and false positive reactions may occur after immunization procedures, bacterial, viral or protozoal infections, in association with collagen-vascular disease, or without any obvious predisposing cause. If the tests are positive and there is no *definite* clinical evidence of infection, they should be repeated. If they are again positive, a verification test is advisable, to distinguish a latent infection from a falsely positive result.

The most reliable verification procedure is the treponemal immobilization test (T.P.I. test) in which the patient's serum is incubated with a suspension of living virulent treponemes and guinea-pig serum as a source of complement. If specific antibody is present the treponemes are immobilized and killed. Immobilizing antibody is distinct from, and usually develops after, reagin so that the T.P.I. test is not useful in early syphilis. The indications for the test are: (a) to differentiate 'true' from 'false' positive reactions with reagin tests, (b) to examine patients with lesions possibly due to late syphilis, e.g. aortitis, whose reagin tests are either negative or equivocal. Both the reagin tests and the T.P.I. test give positive reactions in other diseases of the treponemal group and there is no serological test yet available which will differentiate between syphilis and yaws.

A specimen of 10 ml. of blood is required for these tests. This should be taken aseptically into a dry sterile container without any added preservative. If a T.P.I.

test is required, it is important that information about recent treatment with antibiotics should be provided as traces of penicillin in the blood interfere with the test. Cord blood should not be used in taking specimens from newly born babies. Satisfactory samples can be obtained by sterilizing the skin of the child's heel with spirit and making a small nick with a sterile razor blade.

Maternal antibody may pass through the placenta, and the finding of a positive serum test on blood from a baby does not in itself indicate infection. If the child has escaped infection, quantitative tests will show that the reagin tests decline in titre and revert to negative within about three months. The T.P.I. antibody takes longer to disappear, usually six to nine months. If the baby has been infected, both types of test show a rapid increase in titre.

CEREBROSPINAL FLUID

For the detection of neurosyphilis investigations should include a cell count (normally 0 to 5 per c.mm.), protein estimation (normally 15 to 40 mg. per cent.), a Pandy test for globulin, Wassermann reaction and a Lange colloidal gold curve. The cell count and protein content of the fluid give the most sensitive indications of activity of the disease process.

For these tests 5 ml. of spinal fluid is needed. This should be drawn into two sterile containers, so that the cell count can be performed on the second, to minimize any accidental contamination with blood. It is essential that the cells should be counted within an hour of the specimen being drawn as after this time they become disintegrated.

It is desirable that the cerebrospinal fluid be examined before treatment is begun in latent and late syphilis although special circumstances such as pregnancy may prevent this. If the fluid is completely normal at the first examination and adequate treatment is given, further tests on it are probably unnecessary. In cases of neurosyphilis, repeated examinations will be required. The cells and protein content are the first to return to normal and are the most important indexes of activity. The Wassermann reaction and Lange curve are the last to return to normal. The T.P.I. test can be used as an aid to the diagnosis of neurosyphilis in doubtful cases as it is sometimes positive in the cerebrospinal fluid when the other tests are negative.

GONORRHŒA

The diagnosis of gonorrhœa is made by the examination of gram-stained smears of secretions and by culturing the gonococcus.

SMEARS

In the male the meatus should be cleaned with spirit and a loopful of urethral discharge spread as thinly as possible on a clean microscope slide. Satisfactory films are most easily obtained by spreading the discharge with the end of another slide as in making a blood film. The film is fixed by passing the slide, smear side uppermost, two or three times through a bunsen flame. Overheating should be avoided and the slide should not become too hot to hold on the back of the hand. In the female, smears of secretion should be taken from the urethral orifice, and cervix, and from the orifices of Bartholin's glands and Skene's ducts if these appear inflamed. Smears of vaginal secretion are of little value except in vulvo-vaginitis in

children. If the discharge is very mucoid, it can be emulsified on the slide in a drop of tap water before spreading. The fixed smears should be clearly labelled with the patient's name and the site from which the specimen was taken.

CULTURES

Although a presumptive diagnosis is usually possible from an examination of stained smears in acute infections, culture of secretions is necessary in chronic disease, especially in women, and must always be performed if there is any possibility of legal proceedings being instituted. In cases of ophthalmia neonatorum cultures should be made as well as smears.

The gonococcus dies rapidly if the secretions are allowed to dry and the use of Stuart's transport medium facilitates its isolation.

The outfit provided for this consists of a special swab on a wooden applicator, which is soaked in the secretion to be cultured, and then plunged to the *bottom* of the bijou bottle of transport medium, the projecting applicator cut or broken off flush with the lip of the bottle and the metal cap screwed on *tightly*. The bottle of medium containing the swab should be sent to the laboratory as soon as possible; if this has to be delayed, it should be left in a refrigerator.

Using this method, gonococci can usually be recovered for up to forty-eight hours. Cultures should not be taken while the patient is receiving antibiotics. A minority of gonococci are now relatively insensitive to penicillin and some are completely resistant to streptomycin; in cases of apparent failure of treatment sensitivity studies are therefore desirable.

The complement-fixation test is only of limited value; it may be helpful in the investigation of complications, such as salpingitis: 5 ml. of blood should be sent for this test.

NON-GONOCOCCAL URETHRITIS

The etiology of this condition is unknown and the only laboratory tests used are the examination of smears and cultures to exclude gonorrhœa. *Trichomonas vaginalis* can be found in the secretions in about 15 per cent. of cases.

TRICHOMONIASIS

T. vaginalis is best demonstrated by the microscopical examination of a drop of secretion (urethral or vaginal) emulsified in saline on a warmed slide. The specimen should be examined immediately it is taken. If there are no facilities for microscopy, specimens can be taken in Stuart's medium as previously described and sent to the laboratory for examination and culture. This method is inferior to direct examination but does give a proportion of isolations if delay in transport is avoided.

LYMPHOGRANULOMA INGUINALE

When this disease is suspected 10 ml. of blood should be sent for a complement-fixation test. When positive at a titre of 1 in 32 or above an active infection is indicated. If the titre is below the diagnostic level, the test should be repeated after ten to fourteen days, as a rising titre is suggestive of activity. The Frei intradermal test may be helpful, but a positive reaction may only indicate previous infection and not necessarily present activity.

PRINCIPLES OF REHABILITATION

IX.—HOUSEHOLD INDEPENDENCE

By W. RUSSELL GRANT, M.R.C.S., L.R.C.P., D.Phys.Med.

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In addition to work in the kitchen, the handicapped housewife can be assisted to perform many other household duties. Indeed, the aim should be to enable her to attend to as many as possible of the multifarious duties which fall to the lot of the lady of the house these days. Among these the

Fig. 1.

Fig. 2.

Fig. 1.—Elbow-crutch method for one-armed person using an ordinary broom.
Fig. 2.—Washing the floor by the plastic bucket and mop method, the former being carried on step of wheel-chair. Note: rope for attachment to arm-rest to prevent spilling.

main ones are: (i) dusting the floor, (ii) washing the floor, (iii) cleaning furniture and dusting, (iv) mending, including the use of sewing machines, (v) bed-making.

DUSTING THE FLOOR

The chair-bound person with reasonably good upper extremities will need: (i) a dustpan with a long handle, (ii) a broom with a light long handle, (iii) a carpet sweeper. It is not always realized that vacuum cleaners can be operated equally well from a wheel-chair. In our experience the easiest type to operate is the one in which the machine remains stationary on the floor so that the patient only has to manipulate the flexible tube and the appropriate suction nozzle. Most patients find the most convenient way to use this is by placing the flexible pipe over the shoulder and working on the piece of floor in front and on either side of them. When one piece of floor has been covered the action of wheeling the chair on to the next area is quite sufficient to tow the machine over the floor.

The problem is rather different for the person who, though ambulant, has not the power of bending down very far and has to operate more or less with the lower extremities extended all the time. Once again, the long-handled dustpan is an essential piece of equipment and also the broom which has the brush part attached to the main handle by a strong flexible portion. This enables the broom to explore the floor underneath short-legged pieces of furniture, which would not be possible by the ordinary variety.

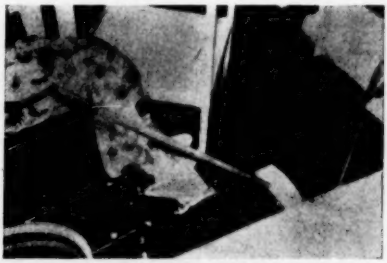


FIG. 3.—Rectangular mop fitted with sponge being used from wheel-chair. Note: plastic bowl on lower shelf of walking-aid trolley being used for necessary soap and water.

In the case of the hemiplegic, the ordinary broom-handle is ill-adapted for use by one hand. Here a simple arrangement (fig. 1) not unlike the upper end of an elbow-crutch enables the patient to have far greater control and to produce the desired result with far less effort. With regard to the type of dustpan used, this calls for one which can be stood up and the dust swept into it since the hemiplegic cannot operate more than one item at a time. Various ways of doing this, such as wedging the handle of the long-handled dustpan, or weighting the actual container, can usually be worked out.

FIG. 4.—How hose may be used for filling bowl on walking-aid trolley. Simple suction arrangement on tap can also be used for emptying.

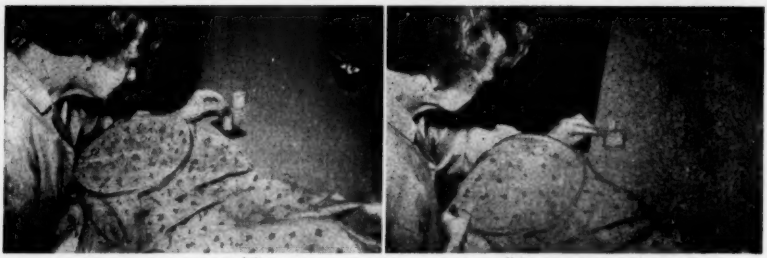
FIG. 5.—Same mop as that shown in figure 3 being used by wheel-chair patient for cleaning windows.

WASHING FLOORS AND WINDOWS

This necessitates some method of transporting soapy water and a method of applying it to the floor. For chair cases and others, a very light small

plastic bucket is preferable to the ordinary one: this can be carried on the chair foot-rest (fig. 2). It is usually a wise precaution to tie a piece of string on to the handle of the bucket and on to the arm of the chair to prevent the bucket inadvertently being tipped over.

Probably the best mop for the floor is the popular one now on the market, with a rectangular head (fig. 3) and fitted with sponge. Most of these have



(a) (b)

FIG. 6.—One-handed method of threading needle: (a) by needle stuck in cork, (b) by needle-threader which operates by pressing a lever.

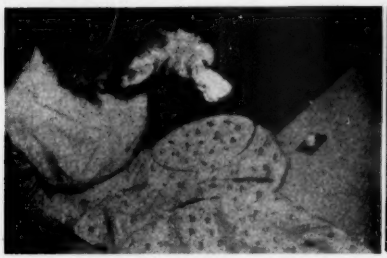


FIG. 7.—Method of holding material over large embroidery frame fitted with clamp to attach to table.

FIG. 8.—Method of darning socks one-handed.

a longitudinal hinge which enables the mop to be squeezed dry simply by folding the two halves of the head together and squeezing out the water in this manner. Water for this purpose may be contained in the washing-up type of bowl on the lower shelf of one of the walking-aid trolleys (fig. 3, 4).

Windows.—These can be very effectively cleaned by the type of rectangular plastic sponge mop already mentioned (fig. 5).

POLISHING

Polishing, of course, can be carried out manually with the type of mop just described, using a non-slip polish, but if there is any degree of weakness in the upper extremities it is usually a sound investment to obtain one of the many inexpensive motor-driven rotating brush types. Polishing of tables and the like is reasonable for a chair or standing patient, and for getting a little extra reach one should not forget the invaluable washing tongs previously described.

With regard to dusting more out of the way areas, there is still little to beat the very light cane-handled feather mop.

SEWING AND MENDING

The main problems in sewing depend on (i) threading the needle, (ii) holding the material. There are two easy ways of threading the needle. Many hemiplegics achieve this by sticking the needle into a cork, stuck on to a firm base, and then aiming the piece of cotton or thread through it with the good hand (fig. 6a). There is, however, a small gadget on the market, which sells for about 3*s*., into which the needle is put up-side-down, i.e. with the eye downwards, and by pressing a little lever with the finger, a loop of cotton is pushed through the eye of the needle (fig. 6b).

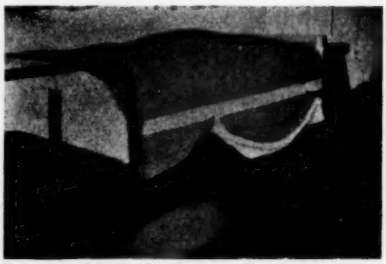


FIG. 9.—Method of clamping lower two-thirds of bedclothes to facilitate bed-making from other side. The small clamps are shown with the loops by which they are tightened sticking out into the room. This is only to make the explanation of their use more clear; normally they are clamped in the reverse position so that they protrude only under the bed.

The problem of holding the material varies with the type of article. For darning socks, the well-known 'mushroom' can be fixed on to a wooden base and attached by an ordinary ping-pong-net type of clamp to the table. Similarly, for sewing cloth, the well-tried embroidery frame is very useful and this can be obtained with a clamp already fixed to it (fig. 7); alternatively, with very little ingenuity it can be attached to a piece of wood suitable for clamping on the table, as with the stocking darner (fig. 8).

Sewing-machines.—Ways of controlling these are well known. A hemiplegic can manage very well with a foot switch-control provided she has two or three light weights to put on the material so that she can keep it straight when guiding under the foot of the sewing-machine. The foot-switch, of course, can be equally well operated by hand, if placed on the table.

BED-MAKING

This presents quite a problem to the wheel-chair person, mainly in manœuvring and correctly positioning the various layers of sheets and blankets over the mattress. If, however, a little assistance can be obtained once a week or whenever sheets are changed, it is helpful, by using a piece of wood 2 x 1 inches (5 x 2.5 cm.) and $3\frac{1}{2}$ feet (1 metre) long to clamp the full thickness of the bedclothes on to the bed-frame from the foot of the bed for $3\frac{1}{2}$ feet (1 metre) upwards to the head (fig. 9). By going to a similar position on the opposite side of the bed, it is now possible to pull each sheet and blanket individually firmly and smoothly across the bed and tuck them in. Having got this started, it is then easy to complete the remainder of the bed-making. The side which is clamped is not, of course, tucked under the mattress but is surprisingly draught free.

REVISION CORNER

SNORING

An unidentified wit once remarked: 'Laugh, and the world laughs with you. Snore, and you sleep alone'. Such a comment could readily set off a chain reaction of stories about a universal complaint. Yet to judge by the comments of people who listen nightly to a disorder that victimizes those so unfortunate as to possess good hearing, snoring is far from a laughing matter. It has been estimated that one person in eight snores, with as many women as men producing a non-sonorous nocturnal cantata when they are blissfully unconscious. The assorted snorts, hisses, buzzes, gurgles and raspings of the snoring nuisance hold the seeds for the ruination of an ostensibly happy marriage. Many married couples find it imperative to establish a schedule wherein one spouse tries to precede the other in sleep. Others proceed to separate bedrooms and possibly even to the divorce courts.

CAUSATIVE FACTORS

Some years ago a psychologist at an eastern American university observed the amount of noise broadcast by members of the snoring entourage. The Colgate University study measured one group of snorers at 40 decibels and another at 69 decibels. In terms of contrasting loudness intensity, the tick of a watch was measured at 10 to 30 decibels, ordinary conversation at 40 to 60 decibels, and a pneumatic drill at 70 to 90 decibels.

To understand the mechanics of snoring, something should be said about anatomy, physiology and physics. Snoring for the most part is generated by several structures in the nose and throat while the person inhales or exhales during sleep. Sounds are caused by vibrations in the soft palate and other soft structures of the throat in response to inflowing and outflowing air. Vibrations are also influenced by the position of the tongue. They occur when the soft tissues of the mouth and throat come close to the throat lining. Snoring can be compared with the noise made when a breeze causes a flag to flutter on a pole. The frequency of vibrations depends upon the size, density and elasticity of the affected tissues and on the force of the air flow. Although snoring usually results from inhaling through the mouth, there are instances in which short snores (known as snorts) take place through the nose with the mouth open. In fairness to snorers, it should be emphasized that snoring is an involuntary act.

LOCAL REMEDIES

Fortunately, a number of the causes of snoring can be ameliorated, and even cured. In the case of children, large, hypertrophied tonsils and adenoids may produce mouth-breathing, a nasal quality to the voice, and, of course, snoring. Here, snoring is cured by removal of the enlarged, obstructing

tissues. A blocked nose may lead to both mouth-breathing and snoring. From time to time snoring is traceable to a deviation of the nasal septum. A perfectly straight septum is rare but, even when it is straight, a ridge or spurlike thickening may occur on the septal wall. People vary considerably in complaining about blockage of the nose due to a bent or twisted septum. If the snoring is due to a deviated septum, it can be cured by surgical means.

A blocked nose resulting from infection, allergy or thickened membranes is still another cause of snoring. Congestion and swelling of the nasal mucous membranes occur in the common cold, sinus disease, hay fever and nasal allergy, to name an important few. Treatment by means of nose-drops, oro-nasal decongestants, anti-infective drugs, antihistamine preparations and steroid hormones will often prove helpful in reducing congestion and infection. Long-continued attacks of nasal allergy and chronic sinus infection occasionally give rise to the formation of polypi. Nasal polypi are benign, movable, jelly-like masses generally arising from the sinuses. Sometimes they become so large that they extend from the back of the nasal sinuses into the upper part of the throat. Nasal obstruction is the chief symptom produced by large polypi; snoring is another. Snoring due to polypi is readily corrected by the surgical removal of the offending growths. Finally, too much smoking, overwork, fatigue, obesity and general poor health may affect the tone of the tissues of the throat and culminate in snoring. Snore for snore, the largest group of offenders are the elderly, presumably because they lack tissue tone.

In many instances, the practising physician can expectantly do more than jest about the snoring nuisance. First of all, irrational measures should be tossed into the therapeutic wastebasket, so that a method like total amputation of an enlarged uvula, which was once a favoured treatment for snoring, is now discredited. Injection of a sclerosing solution into the soft palate has also been found wanting.

GENERAL MEASURES

Many snorers perform only when lying on their backs. To curtail snoring, such a sleeper should be induced to change the position of his head in order to prevent the tongue from falling back. One way of doing this is to make it uncomfortable to lie on the back. Dating from the end of the eighteenth century, one method to prevent a snorer from sleeping on his back has been the sewing of a hair brush or other hard object to the back of the snorer's nightshirt or pyjamas. Once in a while, metal collars are prescribed to extend the neck and thereby interrupt snoring, but this is hardly a pleasure. The snorer can accomplish the same thing by sleeping with a small pillow under the nape of his neck. Still another procedure for the wideawake to follow is to snap the fingers at the sleeping snorer or else make a 'clucking' noise with the tongue. This procedure is sometimes effective, at least temporarily.

More than 300 snore-curtailing devices are recorded in the patent office

of the United States. The fact that there are so many speaks eloquently for the immensity of the snoring problem. Among these devices are various types of orthodontic splints and chin-straps designed to keep the mouth closed. The purpose of some of them is to alter the shape of the mouth to prevent the tongue from falling into a 'snoring position'. Snoring can sometimes be prevented, or at least repressed, by a strip of adhesive plaster across the corner of the mouth or else by applying a mouth-closing bandage. Attempts have been made also to alter the position of the tongue, soft palate, and jaws by means of breathing, phonetic and swallowing exercises, in the hope of training the snorer to regain proper neuromuscular control.

CONCLUSIONS

From the foregoing comments, it is possible to draw two sound conclusions about snoring. The first is that snoring is repressible, even curable, when a definite cause-and-effect relationship is discovered and successfully treated. The other is that the agonized listener, helplessly adrift on a sea of snores, can always wear ear-plugs to shut out the unwanted noise when everything else fails.

NOAH D. FABRICANT, M.D.
Chicago, Illinois.

SPONTANEOUS HYPOGLYCÆMIA

THE wonder is that we do not all suffer from hypoglycæmia since the normal pancreas contains about two hundred units of insulin. This is about five times as much as a person without a pancreas needs each day. If it were all released into the circulation it would produce severe, even fatal, hypoglycæmia.

BETA-CELL ADENOMA

In spite of this, spontaneous hypoglycæmia is a rare condition. The most important cause is a tumour. This is usually a single benign adenoma of the beta cells, but rarely there may be several tumours. The condition is rare in children and old people, occurring mainly in the 20 to 50 age-group. The sexes are equally affected. There seems to be a family history of diabetes more often than would be expected by chance, although the significance of this is not clear. The symptoms are weakness, mental confusion, drowsiness or complete loss of consciousness, anxiety, visual disturbances, sweating, palpitations, tremor, aggressive behaviour, amnesia, headache. In a severe attack coma may be profound and lead to convulsions and death. These symptoms occur in attacks which tend to worsen as time goes on.

Diagnosis is important since the condition is debilitating, even fatal, and yet is completely curable. In most cases there is considerable delay in reaching a diagnosis. Diagnosis depends upon suspecting the condition

whenever a patient gives a story of sudden, severe attacks in which one or more of the characteristic symptoms appear, especially if the attacks occur before breakfast or during fasting and if they are relieved by eating. The attacks may be produced by exercise. It will be clear from their character how it is that the condition is so commonly misdiagnosed as functional. Unfortunately, the majority of patients with islet-cell tumours have been labelled as neurotic before someone, suspecting the right diagnosis, estimates the blood sugar. Organic conditions for which islet-cell tumour may be mistaken are epilepsy, cardiac arrhythmia (particularly Stokes-Adams attacks), cerebrovascular disease and phæochromocytoma. Diagnosis may be difficult. It can be made if a low blood-sugar level (<50 mg./100 ml.) is found during an attack, but a normal level does not preclude the diagnosis since, after severe hypoglycæmia, coma may persist for hours or days after the blood sugar has returned to normal. During hypoglycæmia the electroencephalogram will be abnormal. There are a few centres where plasma insulin-like activity can be measured. If this is shown to be high in a sample of blood obtained during an attack, the diagnosis is confirmed. It may be possible to produce hypoglycæmia by fasting for forty-eight hours.

The only effective treatment is surgical removal of the tumour which may, however, be difficult if the tumour is very small and deep in the substance of the pancreas. The pancreas may then be mobilized and thoroughly searched. If, in spite of strong clinical probability, no tumour is found, most surgeons favour excision of the body and tail of the gland. During the operation, an intravenous glucose infusion is given and hydrocortisone may be added.

Sometimes hypoglycæmia may be produced by diffuse hyperplasia of the islets.

OTHER CAUSES

(1) The so-called *functional hypoglycæmia*, assumed to be due to excessive stimulation of the pancreas.—This condition, which is often difficult to define and may closely simulate, or be associated with, emotional disturbance, is seldom severe. In some cases it seems to be a precursor of diabetes mellitus. Perhaps it represents a stage of islet disorder leading to delay in the secretion of insulin after food, later progressing to frank insufficiency. It is best diagnosed by following the blood-sugar level for five hours after giving 50 grammes of glucose by mouth and best treated by frequent feeds of high-protein and low-carbohydrate content.

(2) Some of the symptoms of *Addison's disease* (whether due to primary atrophy or disease or secondary to pituitary damage) may be attributable to hypoglycæmia. It is most important, however, to remember that these patients, lacking the 'permissive' function of normal adrenal steroids which maintain carbohydrate reserves, are so sensitive to administered insulin that even the small dose used in the standard insulin tolerance test (0.1 unit per kg. body weight) can be fatal.

(3) *Postgastrectomy hypoglycæmia.*—The dumping syndrome consists of a feeling of abdominal fullness, faintness, nausea, sweating and weakness coming on a quarter- to half-an-hour after meals. It was at one time thought that these symptoms were due to hypoglycæmia. Opinion has now turned against this view since low blood-sugar levels have not been demonstrated during the attack and the attacks seem to be related to other factors such as posture, suggesting a mechanical cause such as rapid distension of the ileum. Some patients, however, develop symptoms about an hour after meals, and these may be due to hypoglycæmia. When an oral glucose tolerance test is done on a patient who has had a gastrectomy, it often shows a rapid rise of blood sugar then a steep fall, sometimes to very low levels after one hour. A similar mechanism may be the cause of the post-gastrectomy hypoglycæmia. It is often difficult to prove that a patient's symptoms are due to hypoglycæmia; certainly they are more often due to 'dumping'.

(4) Experimentally, *hepatectomy* leads to profound hypoglycæmia. One might expect therefore that severe liver disease would lead to hypoglycæmia. This does sometimes happen, but it is rare. Indeed, it is remarkable that a liver can be almost replaced by tumour and yet maintain apparently normal function.

Other conditions occasionally associated with hypoglycæmia are glycogen storage disease, rare neoplasms, usually sarcomas, and an inherited sensitivity to leucine or other amino-acids.

D. A. PYKE, M.D., M.R.C.P.
Physician to Outpatients, Department of Diabetes, King's College Hospital.

NOTES AND QUERIES

Rubella in Pregnancy

QUERY.—A recent report on rubella in pregnancy (H.M. Stationery Office, London) stresses amongst other things that the risk to the fœtus is not as great as originally thought. This, of course, is most encouraging. It is still stressed that a natural attack of the disease before childbearing is the best protection.

I seem to recall some years ago reading a Scandinavian report which suggested that in the first trimester a woman in contact with rubella caused her baby as great a risk of abnormality irrespective of whether she had had rubella or not: in other words, the virus could cross the placental barrier and produce damage despite her having had previous infection with the disease. If this is so, then clearly it is a false insurance to be infected in early life, and the only true protection is to avoid contact in the early months of pregnancy.

I should be grateful to know whether there is anything in this as it must clearly affect the advice one gives to patients.

REPLY.—It is correct that instances have been reported where children have been born with 'rubella syndrome' following the exposure of the mother to rubella during pregnancy, but without overt rubella in the mother (Warkany, 1947; Malmberg *et al.*, 1957). It is known from volunteer studies that patients may have rubella without a rash, but there is also clear evidence that the risk following exposure without overt rubella in pregnancy is small, and in no way comparable with that following an overt in-

fection. Michaels and Mellin (1960) reported a prospective study which included 95 mothers who were exposed to rubella without overt illness during pregnancy (in 38 the exposure was within the first 12 weeks), and none of these had malformations of the type associated with maternal rubella. How many of these mothers had had previous rubella infections could not be determined. They reported further that, in the spring of 1955, there was a high incidence of rubella in New York City, but of 653 infants born in the survey from March 1955 to March 1956, none was found to have cataract, although all live-born infants had routine ophthalmological examinations at birth. Accordingly, there is every reason to encourage girls to experience rubella in early life.

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C. O. CARTER, B.M., M.R.C.P.

Post-Infectious Encephalitis

QUERY.—I have recently seen a three-year-old child who has been in hospital with 'measles encephalitis' and 'pneumonia'. There appear to be no residual signs of encephalitis now.

The parents have been asking whether there is any increased chance of encephalitis with any other childhood illness. I cannot remember ever seeing a further encephalitis following an infectious disease, but I should be grateful for expert advice.

REPLY.—I have not seen, nor do I know of any reference to, an increased risk of encephalitis following an infectious disease in a child who has already had a post-infectious encephalitis. There would, however, be a great risk of encephalitis if such a child were ever given rabies vaccine.

F. L. KER, O.B.E., T.D., M.B., CH.B.

Treatment of Rheumatoid Arthritis

QUERY.—I have a patient, aged 50, with a subacute rheumatoid arthritis, which he has had for eight to ten years. The disease is not very active just now, but every two to three months he gets a mild flare-up in one of his joints, usually a knee. He is in a highly paid and skilled job, which necessitates his being mobile and active, and he will not rest for more than a day or two.

He is under continuous treatment with aspirin, 30 to 40 grains daily (2 to 2.4 g.), but I have found that prednisolone, given for a week starting at 10 to 15 mg. and reducing the dose by 2.5 mg. daily over the week, gets him over his relapses much more quickly. This is rather on the analogy of asthma—using steroids for the severe wheeze when ephedrine has failed.

I should be grateful for an expert opinion on this regime.

REPLY.—This is a perfectly reasonable way to treat acute episodes of rheumatoid arthritis in a patient who is unable to rest. Usually in this disease the periods of activity last months or years but in a few they are short-lived.

It is important not to give a dose of prednisolone over 15 mg. daily, and to reduce slowly as is being done. If this patient should develop an acute infection or any condition requiring surgery, it would be wise to give a depot of corticosteroids, for instance 25 mg. of prednisolone intramuscularly twenty-four and two hours before operation, as the adrenal cortex might be slow in responding to extra stress.

OSWALD SAVAGE, O.B.E., F.R.C.P.

Post-Partum Eclampsia

QUERY (from a reader in Canada).—I have a patient who had post-partum eclampsia following the birth of her first child 29 months ago, and is due to have her second child in two months' time. What are her chances of again developing post-partum eclampsia? Is there any prophylactic treatment which may lessen her chances of further fits?

She is an intelligent girl who was 18 years old when she had her first pregnancy. During this pregnancy blood pressure remained between 120 and 125 mm. Hg systolic and 75 and 80 mm. Hg diastolic. Weight gain never exceeded 4 pounds (1.8 kg.) in any four weeks, and the total gain was 20 pounds (9 kg.). She never had any œdema or albuminuria. She has a past history of scarlet fever and rheumatic fever as a child and was three months in hospital because of the latter illness. On physical examination she has a soft blowing apical systolic murmur, but is otherwise perfectly normal.

The first stage of delivery lasted sixteen hours and was quite normal, the second stage lasted forty-five minutes and a small episiotomy was done, using 2% procaine without adrenaline. She was given pethidine for analgesia in the first stage, in normal doses, trichloroethylene inhaler in the second stage. Oxytocin and ergometrine were used in the third stage. During the third stage her blood pressure was noted to be labile—90/70 mm. Hg to 160/120 mm. Hg—and after the placenta was delivered she complained of gradually increasing headache which was quite severe. Then, about fifteen minutes after delivery, she had a typical eclamptic seizure. She was given morphine, ¼ grain (15 mg.), and recovered in a few minutes, then had a second fit about fifteen minutes after this.

Next day she appeared quite normal except for the blood non-protein nitrogen which was 44, 36 and 46 mg. % during the next three days, whilst the urine showed 1 plus albumin. The blood pressure rapidly returned to normal (120/80 mm. Hg) on the day of delivery. She has remained very well since this incident and has been absolutely normal at each of her recent antenatal visits.

REPLY.—Post-partum eclampsia is very unusual without some signs of pre-eclamptic toxæmia. There is always a risk of pre-eclampsia recurring in subsequent pregnancies but it is less frequent than in the first and particularly when the toxæmia was of short duration.

I would suggest managing this patient on the usual lines, with frequent antenatal visits during the remaining part of this pregnancy, a strict watch on the weight, blood pressure and urine, and a reduction in the sodium intake. Since the labour was normal, at the first sign of any trouble after 36 to 37 weeks a surgical induction of labour could be carried out. Generous sedatives should be given during labour and the first twenty-four hours post-partum. The use of hypotensive drugs is not worth while in a case of this kind which is of late onset, and in any event it is extremely unlikely that the eclamptic fits will recur.

W. R. WINTERTON, M.B., F.R.C.S., F.R.C.O.G.

Elective Cholecystectomy

QUERY.—I have a female patient, aged 31 years, in whom a solitary gall-stone about the size of a cherry stone has been found incidentally on x-ray examination. There are no symptoms referable to the gall-bladder, and a cholecystogram shows a normally functioning organ. It has been suggested that an elective cholecystectomy be performed on the grounds that otherwise there is a risk of her developing cholecystitis in the future, and to forestall malignant changes occurring. I should appreciate your views in this matter.

REPLY.—Some surgeons would agree with the advice given to this patient that operation should be performed for an incidentally discovered solitary gall-stone in the gall-bladder without symptoms as a prophylactic measure. Most surgeons, however, would not press operation. It is well known that a gall-stone may remain indefinitely without causing trouble and the possibility of malignant change in the gall-bladder is remote in the absence of chronic inflammatory complications. Personally, I would explain the position frankly to the patient but not press operation unless she developed symptoms.

DAVID H. PATEY, M.S., F.R.C.S.

'Burning Feet' in Diabetes Mellitus

QUERY (from a reader in the Sudan).—I should be grateful for your comments about the following case:—

An old man of 67 years, diabetic for the last twelve years and stabilized on insulin, with tolbutamide or chlorpropamide occasionally. His complaint is of persistent pain of burning character in both feet for the past two years, particularly in hot weather, which is partially relieved by exposure to cold. He has had mild attacks of paroxysmal dyspnœa for the last three years. His build is fair, and there is some dehydration. The heart sounds are faint, and there are some crepitations at the bases of the lungs. The blood pressure is 160/80 mm. Hg; the electrocardiogram within normal limits. There are no trophic or colour changes in the lower limbs, but there is anæsthesia of 'glove and stocking' type up to the middle of the legs, with very tender calf muscles. Pulsations are present in both limbs, but the arteries are somewhat arteriosclerotic.

He was put on huge amounts of vitamin B_1 and B complex ('parentrovite'), vitamin B_{12} and pantothenic acid, vasodilators (nicotinyl alcohol) and diuretics (hydrochlorothiazide)—with amelioration of all his symptoms except the burning pain of the feet which is making the patient miserable.

REPLY.—The burning pain of which this patient complains is very suggestive of ischæmia, but the information provided in the question is not sufficient to exclude neuropathy; the fact that the pain is relieved by exposure to cold supports the former diagnosis. In these circumstances it is impossible to be dogmatic about treatment. If the pain is due to ischæmia, the only conservative treatment likely to help in any way is to keep the foot cool and give the patient a suitable combination of analgesic and hypnotic, such as 'sonalgin', at bedtime. If this fails to relieve the pain and the patient becomes unable to sleep, it may be necessary to consider below-knee amputation; sympathectomy is rarely successful in the relief of ischæmic pain in the diabetic. If, however, the pain is due to neuropathy, the best treatment is to control the diabetes as carefully as possible and give 'parentrovite H.P.' intravenously in doses of 10 ml. twice a week for eight to ten injections.

WILFRID OAKLEY, M.D., F.R.C.P.

Transmission of Brucellosis

QUERY.—Does contagious abortion in cattle infect man? What are the invasive symptoms? What preventive measures should be taken by human beings working on land where the disease

is endemic? Has *Brucella abortus* adapted itself to man?

REPLY.—Contagious abortion in cattle may be due to *Vibrio fœtus*, which does not infect humans, or to various strains of brucella which certainly do. Infection may occur through the handling of diseased animals, the products of conception, contaminated litter, carcases or biological specimens; or else by the ingestion of infected raw products such as milk, cream and cheese. It follows that the most likely victims are farm workers, veterinary surgeons, meat handlers, laboratory workers and those who drink much milk, such as children or patients on 'gastric' diets.

It would be more correct to say that man has adapted himself to brucella than the converse. Brucellosis in this country is usually a mild disease, and most people who are infected with it suffer only minor symptoms and never know that they have had it. When outbreaks are studied, as happened in schools which were evacuated to the country during the war, or to my knowledge in an isolated Wiltshire village recently, it is found that most of the cases are subclinical. Farm workers and veterinary surgeons usually acquire immunity through repeated subclinical infections. Cases of infection being passed from human to human are exceedingly rare. From the point of view of the organism therefore man is an unsatisfactory host and adaptation is not successful.

The invasive symptoms are legion. The main ones are of gastro-intestinal or respiratory upset. Aching of the muscles, headache and sweating are prominent features. Weakness and lethargy follow, and may continue for years with exacerbation in the afternoon and evening. Hæmorrhages sometimes occur, and in the convalescent stage arthritis is quite common. Involvement of the central nervous system has been reported. The very chronic state characterized by weakness, lethargy and vague aches and pains without physical signs often causes the patient to be labelled as psychoneurotic.

Preventive measures should be aimed at eradicating the disease rather than accepting it as 'endemic'. A policy of immunization of cattle with a live modified organism (strain 19), and destruction of infected animals, has proved successful in other countries. In individual cases the infected animal should be destroyed or isolated. The products of conception and the litter should be burnt and the stall disinfected. No prophylactic immunization for humans is available in this country, but in Russia a vaccine has been used. It is not safe to use strain 19, as serious disease has been noted after it has been accidentally injected into veterinary workers.

HUGH WALLIS, M.D., M.R.C.P., D.C.H.

Myopia and Judo

QUERY.—I wonder if you could help me in the following problem. As a myope of —5 what would be the risks involved in taking up the sport of Judo? I am asking this with reference to retinal detachment. Although no actual blows to the face or head are received, there is considerable jarring in the break falls. In view of the degree of myopia, how great a risk would one incur in the practice of this sport?

REPLY.—Myopia and trauma are the two principal etiological factors in the production of a tear in the retina which is the cause of simple retinal detachment. Even a moderate degree of myopia, such as 5 dioptres, increases the rate of incidence considerably, provided of course that the myopia is of the progressive type which generally increases during adolescent years and not the static type in which there is some inherent abnormality in the lens or shape of the globe. Assuming that the myopia is of the progressive variety, one would wish to know the present state of the vitreous and whether it has undergone degeneration or shrinkage, and whether the retina shows any peripheral changes such as lattice degeneration especially on the temporal side. Assuming that there is no evidence of either of these weaknesses, the risk of detachment is slight, but it would be unwise to recommend to any myopic subject an occupation which involves severe jerks to the head or, even worse, to the eyes.

HAROLD RIDLEY, M.D., F.R.C.S.

Treatment of Plantar Warts

QUERY.—In the May 1961 issue of *The Practitioner* (p. 667) there was a note on the treatment of plantar warts by a preparation named 'chlorosal'. Would it be possible for you to let me have details of the method of application of 'chlorosal'?

REPLY.—We have been treating plantar warts with 'chlorosal' for some years now in the school medical service in Burton-upon-Trent and, after trying a number of different forms of treatment, we consider this to be the most satisfactory. The formula of 'chlorosal' is:—

Salicylic acid	60%
Chloral hydrate	5%
Liquid paraffin	35%

The technique for applying this substance is important, and the complete details are as follows.

(1) The wart and surrounding skin are cleansed with cetrimide.

(2) A one-inch (25-mm.) corn pad, with a central hole ¼ inch (6 mm.) in diameter, is fixed with flexible collodion B.P. over the wart, with the hole over the wart itself.

(3) The central hole of the corn pad is filled with 'chlorosal'.

(4) The pad is then firmly fixed in position with 'elastoplast' strapping and left for one week.

(5) When seen at the end of the week, the dead skin is removed with a small scalpel and a fresh plaster applied if the wart is still present.

(6) The patient is advised not to get the foot wet, or to undertake any physical training, games or dancing.

(7) The treatment is repeated as often as necessary—usually weekly for about three weeks.

Finally, there are two details which contribute as much as anything to the success of this treatment. First, 'chlorosal' must be left on for a sufficient length of time, and secondly, as much of the dead skin and wart as possible should be removed with the scalpel before applying a fresh dressing.

G. M. CURTOIS, M.R.C.S., L.R.C.P., D.P.H.

PRACTICAL NOTES

Laboratory Diagnosis of Smallpox

'IT is desirable that all cases of *possible* smallpox should be investigated virologically', according to N. R. Grist (*Health Bulletin*, July 1961, **19**, 46), who outlines the principles of laboratory diagnosis and methods of collection and transport of specimens in such cases. His main recommendations regarding collection and transmission are as follows. *Pre-vesicular lesions* should be scraped with a fine scalpel or Hagedorn needle, attempting to scrape away blood-free tissue pulp. The material thus obtained may best be used to prepare thin smears on clean slides for microscopic examination. Smears can also be extracted and used to inoculate eggs. *Vesicles* should be opened by the scalpel or needle and their fluid contents expressed by the blade and run into glass capillary tubes or made into thick smears on slides for serological testing. For microscopic examination thin smears should be prepared from the tissue pulp from the base of the vesicle rather than from the vesicle fluid itself. The contents of *pustules* may best be prepared as thick smears on slides; the tops of pustules and the crusts or seeds of the later-stage lesions may be collected into a screw-capped 'bijou' bottle. Not less than four lesions should be sampled in this way.

In all cases not less than four slides should be prepared for microscopic examination and smears should be made with one smooth stroke of the blade across the slide, avoiding rotatory and scrubbing movements which damage cells and make interpretation more difficult. Each slide should carry smears from four to six different lesions, but material from a single lesion may be smeared across several slides. The smears should be air-dried and must not be fixed by heat or otherwise. For transmission to the laboratory, dried slides may be wrapped in clean notepaper, interleaving paper between each slide. Specimens may be sent by post if conforming to postal regulations. The laboratory should be warned in advance of their arrival and it is helpful if they arrive early in the working day.

Cat-Scratch Disease

THE benign but often somewhat prolonged course of cat-scratch fever is described by R. S. Fowler and J. D. Bailey (*Canadian Medical Association Journal*, June 17, 1961, **84**, 1365) who investigated 55 children, aged 2 to 14 years, diagnosed during the period 1955-1960. Typically there is swelling of the regional lymph glands, usually axillary or inguinal, within a week or two of receiving a scratch from a cat, the local injury being marked by an indurated papule that may be rather slow to resolve. Low-grade fever and some malaise are present while the illness, which commonly lasts a few weeks, is at its height. Leucocytosis is not the rule; indeed in three-quarters of the patients in this series the white cell count was under 10,000 per c. mm. Although the authors' experience was that suppuration of the glands occurred in 'one-third to one-half' of the patients, they point out that only eight required surgical incision and drainage, the remainder being treated by aspiration (12 patients) or hot compresses. A clear history of a preceding scratch was obtained in only 22 of the children, but of the remainder all except two were in contact with cats. Basing the diagnosis on a positive skin test the authors point out that the clinical picture is occasionally atypical. Palpable enlargement of the spleen was recorded in five patients, erythema nodosum in one and joint pains in another. It is stressed that antibiotics do not affect the course of the disease and treatment, once the diagnosis has been clearly established, is expectant.

Thalidomide in Pregnancy

THALIDOMIDE is 'a safe and effective sleep-inducing agent' for use in the later stages of pregnancy, according to R. O. Nulsen (*American Journal of Obstetrics and Gynecology*, June 1961, **81**, 1245). This conclusion is based upon the findings in an investigation in which this drug was administered to 81 patients late in pregnancy and to 22 non-pregnant patients also complaining of insomnia. That insomnia is a common occurrence in the later stages of pregnancy is suggested by the fact that these 81 pregnant patients requiring a sedative for insomnia occurred among the 125 patients delivered during the five-month duration of the investigation. Three dosage schedules were used. If insomnia was related largely to tension, and anxiety occurred during the day, 25 mg. were given thrice daily and again at bedtime. If insomnia was due almost entirely to excessive fœtal movement or to the abdominal enlargement, a single dose of 50 mg. was given at bedtime. In 27 patients (five who did not respond to 50 mg. and 22 who were given the larger dose to discover whether there was persistent drowsiness the next morning) a dose of 100 mg. was given at bedtime. The over-all results showed that 'successful induction of sleep was attained in 89.3% of the patients, and freedom from morning drowsiness was reported by 98%'.

Orthostatic Hypotension

IN a review of our understanding of orthostatic hypotension, A. Shirger and his colleagues (*Proceedings of the Staff Meetings of the Mayo Clinic*, May 10, 1961, **36**, 239), note that the primary or idiopathic variety is of unknown causation, and that the classical triad of low arterial pressure on standing, impotence and anhidrosis may only unfold gradually. Syncope on standing is quite common and is preceded by the usual grey-out. Among the 384 cases seen at the Mayo Clinic in the eleven-year period, 1950-1960, there were four times more men than women. Treatment is largely symptomatic; posture, elastic bandages applied to the legs and the use of a tight abdominal binder all help. Ephedrine, 25 mg. thrice daily, may occasionally give a 'gratifying response'. Among the diseases that may be associated with orthostatic hypotension mention is made of adrenocortical insufficiency, diabetes mellitus and various rare neurological disorders. Attention is also drawn to the fact that 'when a patient is first seen with a sudden unexplained onset of postural hypotension, careful inquiry as to the use of hypotensive or tranquillizing drugs should be made'.

Control of Disseminated Breast Cancer

'IT would appear that adrenalectomy can now be abandoned as a form of therapy for breast cancer', according to O. Daniel (*Proceedings of the Royal Society of Medicine*, July 1961, **54**, 555) who studied the response of individual patients to the successive administration of various forms of treatment. The treatments were: testosterone, oöphorectomy, stilbœstrol, corticosteroids, and finally either adrenalectomy or hypophysectomy 'in order that response to the major forms of therapy could be related to response to the simpler procedures'. There were 112 patients in the series and although none received all the forms of treatment, each received at least three different types. Treatment was changed 'only when it was ineffective and symptoms demanded relief', and all hormone therapy was discontinued for ten to fourteen days before any such change. The following were the main facts revealed by this investigation. Breast cancer is completely resistant to all forms of endocrine therapy in 50% of patients. In those who do respond to primary endocrine therapy hypophysectomy may give further worth-while relief. Ovarian function has a 'profound influence' on the effects of testosterone, stilbœstrol, oöphorectomy and corticosteroids in breast cancer. The primary treatment of choice for disseminated breast cancer in pre-menopausal women is oöphorectomy followed by prednisolone, and in post-menopausal women a combination of stilbœstrol and prednisolone. This regime is described as 'both simple and humane', and 'furthermore provides a useful means of selecting patients who are likely to benefit from hypophysectomy'.

Eosinophilia and Dermatitis Herpetiformis

AN investigation to determine the significance of eosinophilia in the diagnosis of dermatitis herpetiformis was carried out by J. O'D. Alexander (*British Journal of Dermatology*, July 1961, **73**, 267) in 51 patients. Two methods of counting eosinophils were used: the 'film and percentage' method and an absolute eosinophil count. Controls consisted of 97 normal persons mostly between the ages of 19 and 30, 20 cases of other skin diseases chosen at random, and 15 cases of sulphonamide dermatitis. Results showed no significant difference between the mean eosinophil counts in dermatitis herpetiformis and normal persons ($t = 0.351$; $P = 0.8$) or in dermatitis herpetiformis and other skin diseases including eczema ($t = 0.017$; $P = 0.8$), but the count was 'significantly higher' in sulphonamide dermatitis than in dermatitis her-

petiformis ($t = 2.767$; $P = 0.01$). It was concluded that the level of circulating eosinophils is of no diagnostic importance in dermatitis herpetiformis and does not reflect the state of activity of the condition, but in severe cases the count tends to be persistently raised 'often to moderately high levels'. In reaching this conclusion it is emphasized that the 'film and percentage' method alone is sometimes misleading: one patient who actually had eosinophilia only had an eosinophil percentage of 4 and 'without further information might easily have been said not to have eosinophilia'; in 39 cases the percentage count was above normal but an absolute count revealed that they did not in fact have eosinophilia.

Chlordiazepoxide Premedication

'ONE of the cardinal considerations in pre-anæsthetic medication is the creation of a non-apprehensive state without over-all depression', according to C. A. Coppolino and G. Wallace (*Postgraduate Medicine*, June 1961, **29**, 619) who report the results of a clinical trial of chlordiazepoxide ('librium') as a pre-anæsthetic agent. This drug, which has muscle relaxing and anti-convulsant properties in laboratory animals, has been extensively used as a tranquillizer in man. The authors administered it to 400 unselected patients all of whom were about to undergo surgical operations. Half were given 25 mg. and the other half received 50 mg., in each instance with a 'sympathomimetic drying agent' as well, the premedication being given one-and-a-half hours before induction of anæsthesia. All the commonly employed anæsthetic techniques were used and in no case was it possible to show that anæsthetic requirements had been affected by the nature of the premedication. Concluding that 'the ability of chlordiazepoxide to alleviate apprehension seems to be its outstanding characteristic' the authors point out that with a dose of 50 mg., which they regard as optimal, nausea and vomiting did not occur, neither was there evidence of respiratory depression or alteration of blood pressure.

Antisepsis of Surgeons' Hands

AN extended trial, over a period of five months, undertaken by six surgeons at the Middlesex Hospital in order to determine the relative effectiveness of various scrubbing-up techniques as judged by bacterial counts from their hands, is described by J. O. W. Beilby and R. E. M. Thompson (*British Journal of Surgery*, May 1961, **48**, 598). For the first fortnight the standard hospital scrubbing technique was investigated; then five different antiseptics were incorporated in turn, leaving an interval of three or four days between each. The substances tested were (a) 'pHisoHex' (3% hexachlorophane suspended in an anionic detergent cream); (b) soap containing 2% hexachlorophane; (c) 'dettol antiseptic cream'; (d) 'hibitane' (chlorhexidine) obstetric cream; (e) chlorhexidine, 0.5% in 95% alcohol. Hexachlorophane was the only one of these antiseptics that reduced skin bacteria significantly. Used as a cream ('pHisoHex') it was found to have a marked antibacterial activity. Moreover, this persisted for at least three hours, an effect not found in the case of any of the other substances used. The four-minute technique used with 'pHisoHex' was as follows: (1) about 2 ml. in the palm of a hand was rubbed into the hands and arms to just above the elbows for one minute; (2) thorough rinse in running water; (3) use of sterile nylon brush and 'pHisoHex' under running water; (4) repeat stage 1 for two minutes; (5) thorough rinse; (6) dry on sterile towel.

A 'Plastic Foam' Jaw Sling

A JAW sling which will not easily slip 'even on the baldest egg-head' is described by J. Hallam, of the Jaw Injury Unit, Liverpool (*British Dental Journal*, July 4, 1961, **111**, 23). The sling, shown in the accompanying illustration, is made from a two-inch (5-cm.) strip cut from a Woolworth's 'plastic foam' (polyester) bathmat and

is washable and can be boiled. The sling has 'proved comfortable to wear' and the author is 'confident that anyone giving it a trial will soon be glad to discard the many previous harnesses and other aids they have been in the habit of using'.

REVIEWS OF BOOKS

Orthopædics. By GEORGE PERKINS, M.C., M.CH., F.R.C.S. London: University of London. The Athlone Press, 1961. Pp. 975. Illustrated. Price £6 6s.

THIS is a companion volume to the author's book on 'Fractures and Dislocations' published in 1958. The title is not qualified by the usual slightly apologetic terms, such as 'The Essentials of ——', or 'The Practice of ——'. This is the author's testament of orthopædics as he has witnessed it, practised it, and modified it. One of the striking features of the book is the lucid classification of so many of the previously apparently unrelated conditions of bone development and metabolism. The table of contents in itself has a lot to teach on classification of dystrophies and dysplasias. Throughout the book the straightforward approach to diagnosis by careful and standard clinical examination is everywhere emphasized. Diagnosis follows logically from examination, and treatment logically from diagnosis, but not every diagnosis demands a treatment and only by consulting the book can the reader know when to treat and when to leave alone.

This is truly a great book: the reviewer believes it to be the best that has ever been written on orthopædics. The publishers are also to be congratulated on this beautifully produced volume.

A Manual of Cutaneous Medicine. By D. M. PILLSBURY, M.D., D.SC., F.A.C.P., W. B. SHELLEY, M.D., PH.D., F.A.C.P., and A. M. KLIGMAN, M.D., PH.D. Philadelphia and London: W. B. Saunders Ltd., 1961. Pp. 430. Illustrated. Price 43s. 6d.

REVIEWING this beautifully produced book has been a re-education in dermatology as well as a pleasure. It is not a précis of the same distinguished authors' larger text, 'Dermatology' (1956), but a summary specially written for medical students and practitioners. The authors have achieved their purpose admirably, giving clear accounts of the common disorders and just enough on rarities; with sound advice about treatment, aimed at assessing the real value (and the hazards) of the many remedies; also indicating those diseases which may ordinarily be managed effectively in general practice and those requiring more specialized methods and experience.

Over 80% of all skin patients will have one of forty-odd diseases, which are grossly distinctive and recognizable, as one learns to identify birds, flowers, or people; but peek-a-boo inspection can lead to grave error, and the patient's estimate of the extent of his eruption must never be relied upon. Dermatitis and eczema comprise more than half of all skin disease. The term eczema appears infrequently, the authors regarding it as now imprecise, retaining its usefulness only for chronic inflammatory skin changes, especially in infants and the aged, in whom the etiological factors defy detection. Disorders of hair and nails (a discouraging group even to the very experienced) are dealt with sensibly, the rich folk-lore of hypothesis and fanciful treatment (including the use of gelatin, calcium, and vitamins for cracked nails) receiving due debunking, whilst many of the impressive descriptive terms which conceal absence of knowledge in this field are rejected as uninformative. There is an excellent review on the difficult subject of pigmented moles and hæmangiomas, in which, for instance, a wait-and-see policy for strawberry nævi (long advocated by British dermatologists) is recommended. The authors do not employ x-rays in any case of acne and rarely œstrogens, and consider dermabrasion to have proved very disappointing for acne scarring. The goal of treatment in rodent ulcer should be complete eradication by a single procedure—either surgical excision-biopsy or curettage followed by electrocoagulation, x-ray therapy being reserved for lesions not amenable to these measures. In the 'Formulary' there is much wise and practical advice, such as that the topical use of antihistamines is rarely justifiable; and the indications for systemic, intradermal, and topical corticosteroids are well defined.

For those who wish to delve deeper there are authoritative references at the end of the chapters. The diagrams and pictorial material, which comprise about half the volume, are exceptionally good and there is a first-class index.

Modern Trends in Endocrinology (Second Series). Edited by H. GARDINER-HILL, M.D., F.R.C.P. London: Butterworth Medical Publications, 1961. Pp. 349. Illustrated. Price 75s.

WITH the exception of Professor Prunty, the editor has called in an entirely new team of contributors for this 'second series'. Once again the emphasis is upon the pituitary, but the nineteen chapters cover a wide field including the oral hypoglycæmic agents, oral contraceptives, the anabolic steroids and hormonal factors in the genesis of cancer. As in the previous volume the chapters range from the highly technical to the predominantly clinical. This is probably inevitable in this particular field of medicine, in

which the back-room boys have so much say. Difficult though it is for some of them to come down to the level of the ordinary clinician, they have all tried hard—and some of them have succeeded extraordinarily well. Thus, whilst this is predominantly a book for the specialist, the general clinician will find much of interest within its pages.

Essentials of Neurology. By JOHN N. WALTON, M.D., M.R.C.P. London: Pitman Medical Publishing Co. Ltd., 1961. Pp. 422. Illustrated. Price 30*s*.

THIS is not an easy book to read. In the first place, though the print is not unduly small, it gives the impression of being close set, and the eye is apt to be distracted by the use of heavy type to pick out single words. Secondly, the text is often bedevilled by verbosity, and thirdly, one may think the layout of subject-matter a little unwieldy. Although it is logical in theory to divide the latter strictly into three sections (concerned, respectively, with the general symptoms and signs of neurological disorder and investigative techniques, with disease entities, and with treatment), in practice it is less satisfactory. So, for instance, the manifestations and classification of epilepsy are considered in chapter 6, the EEG signs in chapter 3, and treatment in two separate parts, one medical and the other surgical, in chapter 20. The plan also leads inevitably to certain repetitions of more or less the same material at different points, which are no doubt more obtrusive to the critic reading quickly from end to end than to the tyro going at a slower pace.

No author of a textbook can ever hope to carry his brother specialists with him all the way, however, and Dr. Walton does in fact offer a work which should appeal to the more diligent among students and practitioners.

Progress in Clinical Surgery. Series II. Edited by RODNEY SMITH, M.S., F.R.C.S. London: J. & A. Churchill Ltd., 1961. Pp. 327. Illustrated. Price 50*s*.

THIS clearly is a book that must take its place right away in any surgical library. It begins where every other advanced surgical book leaves off, and a surgeon able to master its contents without getting confused would pass any higher surgical examination with flying colours. It is stimulating, as any symposium sponsored by Rodney Smith is bound to be. It is also patchy as any work by a group of writers with varying backgrounds must be. The editor aims 'to produce a volume helpful to the postgraduate student working for the final F.R.C.S. examination'. Will it help him? There is nothing more fatal to success than acute mental obstruction due to voracious over-reading, and nothing mor dangerous in this examination than to know more than the examiners and let them know it In the last resort, the fitness of a man t become a surgeon is decided by his ability t handle the mass of reading matter with whic he is faced—to select, to retain, or to ignore.

The chapters are of high quality, but few o them are clinical. The Fellowship candidat should certainly read d'Abreu on 'Cardia surgery', Rodney Smith on 'Hepatectomy' Robert Cox on 'Ascites', Pyrah on the 'Trans plantation of ureters', Crampton Smith o 'Tetanus', and Charles Drew on 'Metastati tumours of the lungs'. He can browse throug the remainder in the intervals of clinical work but he would be well advised to leave the chap ters on 'Operative technique' alone for the tim being, and to postpone reading the biochemica ones till he has got his fellowship, and till th subject-matter is a good deal clearer than i seems to be to the writers at the present time.

Techniques in Tropical Pathology. By B. G. MAEGRAITH, M.B., F.R.C.P., W. E. KERSHAW, V.R.D., M.D., and D. DAGNALL. Edinburgh: Oliver and Boyd, 1961. Pp. 164. Illustrated. Price 25*s*.

HERE is a guide for medical practitioners in the essentials of laboratory practice in the tropics. It is fascinatingly comprehensive. The collectio of specimens, the manner of their investigation simple techniques for use in a small laboratory o directions for the dispatch of specimens are al well described together with some elementar parasitology and much else besides. Some clinical pathology is included but is not s uniformly successful: the quite advanced hæmat ology is scarcely addressed to the same reader a the account of the hand lens and microscope and it is hard to be sure how either of them would interpret some of the instructions in bacteriology. But there is a fund of practical advice for the inexperienced, and for others too it should prove a useful handbook.

Synovial Joints. Their Structure and Mechanics. By C. H. BARNETT, M.B., F.R.C.S., D. V. DAVIES, M.B., B.S., and M. A. MACCONAILL, M.B., D.SC., M.R.I.A. London: Longmans, Green & Co. Ltd., 1961. Pp. 304. Illustrated. Price 50*s*.

IT is refreshing to have a volume concerned with joints rather than with the topography of individual joints. The authors have been concerned to consider joints as 'organs' and point out in their preface that from the time of Jean Riolan comes the call 'for a study of the joints while their capsules are still intact, that is of the joints as organs and not merely as the meeting

places of the ends of bones'. The book is divided into four sections, of which the first deals with the components of joints and discusses the generally accepted and the more recent additions to the knowledge of the basic structure of joints. In general, section two on the 'Biology of joints', is concerned with the maintenance and metabolic functions of the joint structures. In these chapters, in addition to the standard descriptions of the structure and function of the bone ends, the capsule, the synovial fluids, the ligaments and other structures associated with joints, more recent views are presented with careful and critical appraisal. Sections three and four deal with the movements of joints and their control, and the assessment of the mobility of joints. It is natural that the difficult and controversial subject of the movements of joints makes more difficult reading than some other parts of the text, and the methods of simplifying joint surfaces into two classes only and the joint movements to the two fundamental groups of 'spinning' and 'sliding', whilst aimed at clarifying this complex subject, are perhaps not always successful in doing so.

This monograph will provide up-to-date information (there is an extensive but not exhaustive bibliography) and stimulating reading for all those interested in joints and their disorders. The book is excellently produced and the many histological illustrations and line diagrams clarify the text. There is a remarkable freedom from printer's errors, but the statement ' . . . collagen contains some 400 different amino acids . . . ' must surely be one.

Clinical Anatomy: A Revision and Applied Anatomy for Clinical Students. By HAROLD ELLIS, M.CH., F.R.C.S. Oxford: Blackwell Scientific Publications, 1960. Pp. 369. Illustrated. Price 37*s.* 6*d.*

A RECOGNIZED weakness of the stratification system of medical education is that it tends to make pre-clinical subjects merely obstacles which once surmounted can be forgotten. One of the ways of overcoming this weakness is to continue the pre-clinical subjects into the clinical period in an applied form. In the present work, Mr. Ellis first of all gives a brief synopsis on traditional lines of the anatomy of the various regions, following each anatomical section with a section on clinical features. The work is short, attractively produced, and well illustrated by line drawings. The compressed tabular character and traditional dissecting-room presentation of the pure anatomy makes these sections rather heavy and dull reading, in sharp contrast with the applied sections which make attractive and easy reading. One wonders whether in any subsequent edition Mr. Ellis would not do better to expand the applied at the expense of the traditional anatomy, and thus emphasize more the clinical rather than the dissecting-room approach. Certainly the section on the lymphatics of the breast in which he has done this is one of the best chapters in the book.

Tobacco: Experimental and Clinical Studies. By P. S. LARSON, PH.D., H. B. HAAG, M.D., and H. SILVETTE, PH.D. London: Baillière, Tindall and Cox, 1961. Pp. 939. Illustrated. Price £8.

WITH true appropriateness this massive memorial to 'My Lady Nicotine' emanates from the Medical College of Virginia. Its scope is admirably outlined in the preface: 'The information gathered between the covers of this monograph has been compiled from more than 6000 articles published in some 1,200 journals up to and largely into the year 1959; these have been read and analytically abstracted during a cumulative total of some 50 years' interest of the authors in the biological and medical effects of tobacco'. Little more need be said. As 'a comprehensive account of the world literature' to quote the subtitle, it is a wholly admirable work. It is fortunate for many of us that there are fellow-members of the profession prepared to undertake such an onerous task. Onerous though it must have been, the authors can rest assured that it has not been a thankless one. As a reference book this one will be invaluable, and there will be many casual readers who will enjoy browsing through its pages when they have an odd half-hour to spare in their local medical library.

NEW EDITIONS

Infectious Diseases of Children, by Saul Krugman, M.D., and Robert Ward, M.D., second edition (Henry Kimpton, 97*s.* 6*d.*).—The need for a second edition within two years of publication of the first confirms the deserved popularity of this book. Certain infections, such as infantile gastroenteritis, are omitted but those dealt with are described in detail: indeed, rather too much detail for undergraduates. The illustrations however, are unusually clear and helpful and emphasize the common features of each disease. There are new chapters on rabies and viral respiratory infections with separate descriptions in the latter of the clinical syndromes (exudative tonsillitis, vesiculo-ulcerative tonsillitis, epiglottitis, croup, bronchiolitis and pneumonitis) followed by an account of the many viruses which have been found to be associated with these syndromes. This beautifully produced book can be thoroughly recommended as a practical up-to-date reference for anyone dealing with infections.

Manson's Tropical Diseases, edited by Sir Philip H. Manson-Bahr, C.M.G., M.D., F.R.C.P., in its fifteenth edition (Cassell & Co. Ltd., 84*s*.) is as good as its predecessors—and that is high praise. From the opening chapter on 'Preparations for residence in the tropics' to the concluding section on 'Clinical pathology' it is packed with a wealth of freely illustrated information of amazing accuracy and up-to-dateness. The expert going through it with a toothcomb might very well find the occasional lapse from grace, just as the young registrar seeking novelty might find it slightly old-fashioned in places. For the ordinary clinician, however, no matter in what part of the tropics he may be working, it stands wellnigh supreme. The veteran editor has every reason to be proud of this latest edition of what is still so pleasantly subtitled 'A manual of the diseases of warm climates'.

Eugene Wolff's Anatomy of the Eye and Orbit, by R. J. Last, M.B., B.S., F.R.C.S., in its fifth edition (H. K. Lewis & Co. Ltd., £4 4*s*.), is not a reprint but a revision. What Wolff had to say was said with unsurpassed clarity. This characteristic has been retained as well as the illustrations, many of which were from Wolff's own dissections and preparations. In the revision there is much alteration in the terminology to bring it into line with current usage; the description of the facial nerve has been enlarged and accounts have been added of electron microscopic and biomicroscopic studies. This book provides an important service in a fascinating way; it is an essential for candidates for postgraduate examinations and should be on the reference shelf of every practising ophthalmologist and teacher of anatomy or ophthalmology.

Essentials of Materia Medica, Pharmacology and Therapeutics, by R. H. Micks, M.D., F.R.C.P.I. in its eighth edition (J. & A. Churchill Ltd., 30*s*.) can now claim to be one of the 'old guard' of pharmacology. It is a sign of the care with which this new edition has been prepared that, in spite of many additions, there has been practically no increase in size. As a sound guide to the subject it holds its position in the front rank of pharmacological textbooks.

A Textbook of Histology, by John C. Finerty and E. V. Cowdry, fifth edition (Henry Kimpton, 82*s*. 6*d*.).—For practically thirty years Cowdry's 'Textbook of Histology' has been recognized as the standard book on the subject. Professor Finerty has been responsible for the preparation of this new edition but, as he points out in his preface, 'even though this edition has been completely revised and rewritten, it is still a direct descendant of Cowdry: A Textbook of Histology, and leans heavily on text and illustrations of previous editions'. Profusely illustrated (there are over 700 illustrations) as a book such as this should be, with a consistently clear, concise style, it can be recommended without hesitation. One of its many attractive features is that, although there is quite an extensive bibliography at the end, each chapter concludes with a short list of references for further reading by those who wish to follow up some particular subject.

Textbook of Medical Physiology, by Arthur C. Guyton, M.D., in its second edition (W. B. Saunders Co., £5 8*s*. 6*d*.) has been almost entirely recast and rewritten. Every chapter in the first edition was submitted to authorities in each field for critical appraisal, and the author has also attempted to simplify and clarify the presentation of the subject in accordance with comments from his own students on parts that have caused difficulty. As a result the book presents modern physiology in a concise, authoritative, and simple manner. The whole subject is dealt with from the point of view of the function of the body as a whole, with particular attention to matters of importance in clinical medicine. Numerous bibliographical references are given at the end of each chapter which are particularly valuable for more extensive reading. As a result the book can be recommended, not only to students of physiology, but to all engaged in clinical medicine.

Pocket Book on Tray and Trolley Setting, by Helen M. Dickie, R.G.N., R.F.N., S.C.M., second edition (E. & S. Livingstone Ltd., 8*s*. 6*d*.).—This excellent pocket book sets forth by means of clear line drawings and annotations, ninety-four different tray and trolley settings for various ward and nursing procedures. Not only should it be of help to nurses called upon to prepare for a manœuvre with which they are not familiar, such as wet cupping, leeching or cardiac catheterization, but it is also an indictment of the unnecessary manual labour and memorization required of the nurse of today, which work study, simplification of technique and sterile supply services should do much to resolve.

The contents of the October issue, which will be a special issue devoted to 'Advances in Treatment', will be found on page A 142 at the end of the advertisement section.

Notes and Preparations see page 393.
Notes from the Continent see page 397.
Fifty Years Ago see page 399.
World Health News see page A 17.
Motoring Notes see page A 101.
Travel Notes see page A 105.
Bridge Notes see page A 109.
From a Sussex Window see page A 111.

NOTES AND PREPARATIONS

NEW PREPARATIONS

'DIDREX' tablets each contain 25 mg. of (d)-N-benzyl-N,α-dimethyl-phenethylamine hydrochloride, which is described as a 'sympathomimetic compound with marked anorexigenic action and relatively little stimulating effect on the CNS or cardiovascular system'. They are indicated in the treatment of obesity and are said to cause persistent significant loss of weight over a period long enough (up to 20 weeks) to 'encourage the patient to strive for sustained benefits'. Available in bottles of 50 and 100 press-coated tablets. (Upjohn Ltd., Crawley, Sussex.)

'PRISTACIN' chewing gum, each piece of which contains 4 mg. of cetyl pyridinium chloride and 10 mg. of sodium propionate, is intended for the prevention and treatment of superficial infections of the mouth and throat and as an adjuvant in more serious conditions. It is said that the ingredients are slowly released when the gum is chewed. Available in boxes of 12 and 144 foil-wrapped pieces. (Horlicks Ltd., Pharmaceutical Division, Slough, Bucks.)

'SERENACE' tablets each contain 1.5 mg. of haloperidol, the first of a new group of compounds known as the butyrophenones. They are said to control the major manifestations of psychotic illness including schizophrenic symptoms, delusions, hallucinations and paranoia, mania and agitation. Available in bottles of 50, 250 and 1000 tablets and also as 1-ml. ampoules each containing 5 mg., in boxes of 6 and 25. (G. D. Searle & Co. Ltd., Lane End Road, High Wycombe, Bucks.)

PHARMACEUTICAL NOTES

DISTILLERS CO. (BIOCHEMICALS) LTD. announce that their preparation 'zynotracin' is now available in powder form in a 5-g. plastic puffer pack containing 4.5 mg. of xanthocillin and 500 i.u. of zinc bacitracin in each gramme. (Broadway House, The Broadway, Wimbledon, London, S.W.19.)

SMITH & NEPHEW PHARMACEUTICALS LTD. announce that 'drazine' tablets, each containing 5 mg. of a new mono-amine oxidase inhibitor, phenoxypropazine hydrogen maleate, are now available for hospital use. Issued in bottles of 100 and 500 tablets. (Bessemer Road, Welwyn Garden City, Herts.)

WILTS UNITED DAIRIES LTD. announce that, in addition to vitamin D, 'regal' brand of evaporated milk contains 6.8 mg. of vitamin C in each fluid ounce, and is now supplied in a can with a 'golden-lacquered lining which prevents rusting or discoloration when the can is opened'. (Nutrition Department, Trowbridge, Wilts.)

FORTHCOMING CONFERENCES

Symposium on Domiciliary Midwifery.—In conjunction with the College of General Practitioners, the Royal College of Obstetricians and Gynæcologists is holding a symposium on domiciliary midwifery on Wednesday, October 18, 1961. Full details were given in our August issue (p. 258) and those proposing to attend are reminded that they should apply before October 4 to the Secretary, Royal College of Obstetricians and Gynæcologists, 27 Sussex Place, Regents Park, London, N.W.1.

The Eradication of Tuberculosis in Childhood will be the subject of a symposium to be held in the afternoon of October 18, 1961, at the Cuthbert Wallace Theatre, Royal College of Surgeons of England, Lincolns Inn Fields, London, W.C.2.

Stroke Rehabilitation will be the subject of a conference to be held in the afternoon of November 16, 1961, in the Arthur Thomson Hall, The Medical School, Birmingham 15. Full details of both these events may be obtained from the Chest and Heart Association, Tavistock House North, Tavistock Square, London, W.C.1.

JAMES MACKENZIE LECTURE

THE eighth James Mackenzie Lecture of the College of General Practitioners will be given by the Chairman of the College Council, Dr. Annis Gillie, at 11.30 a.m. on November 25, 1961, at B.M.A. House, Tavistock Square, London, W.C.1. The title of the lecture will be 'Sir James Mackenzie and General Practice Today'.

MACCABÆAN PRIZE

THE Faculty of the History of Medicine and Pharmacy of the Worshipful Society of Apothecaries of London invites entries for the 1962 Maccabæan Prize of 25 guineas and a bronze medal for an essay of not more than 6000 words on any subject connected with the history of medicine and pharmacy. Competitors must be under 30 years of age on March 15, 1962, and the closing date for entries is October 15, 1961. Entry forms and full details may be obtained from the Honorary Secretary of the Faculty, Dr. F. N. L. Poynter, The Wellcome Historical Medical Library, The Wellcome Building, Euston Road, London, N.W.1.

GENERAL PRACTITIONER CLINICAL TRIALS

THE General Practitioner Research Group, whose reports appear regularly in *The Practitioner*, now numbers 120 members who are engaged in general practice in all parts of the country. The Group is thus able to undertake a large number of varied and interesting clinical trials of new drugs, which have a particular application to general practice. It is further possible to study these drugs under varying practice conditions. Owing to the considerable interest in the Group's activities, there is a need for new members and any general practitioner who may be interested in this type of work is invited to write to the Group's secretary at 270 Staines Road, Twickenham, Middlesex.

NEW JOURNAL

Vision Research is the title of a new journal which aims to promote efficient international communication in the field of visual research. The journal will be devoted to experimental studies, reviews and theoretical articles, and the British representatives on the board of six editors are H. J. A. Dartnall and Arnold Sorsby. The journal, the first issue of which, numbered 1/2, is dated June 1961, is published by Pergamon Press Ltd., and will appear quarterly price 70*s.* per annum for individual subscribers; £10 for libraries and government establishments.

G.P. RESEARCH

THE College of General Practitioners has established a Research Foundation for the promotion and assistance of research by general practitioners throughout the country and in those parts of the Commonwealth where faculties of the College now exist. Initially, the income on the sum of £100,000 from the College's general funds will be made available for this work.

ROYAL COLLEGE OF NURSING

THE year 1960, which was marked by the centenary of the foundation of the first nurse training school in England, the Nightingale School at St. Thomas's Hospital, saw membership of the College extended to all nurses who are on any part of the Registers of the General Nursing Councils for England and Wales, Scotland, and Northern Ireland. The recently published annual report shows the wide range of activities covered by the College, one of the most important of which during 1960 was the starting of discussions and consultations with the constitution standing committee of the National Council of Nurses regarding the possible formation of a single national professional organization able to represent all aspect of nursing both at home and abroad.

EDUCATION OF BACKWARD CHILDREN

THE Minister of Education, in a Circular (11/61) issued to local authorities, draws attention to the growing necessity to provide special educational treatment for backward pupils. Since 1946 the school population has risen from 5 million to its present figure of 7 million, resulting in a substantial increase in the demand for places in special schools for educationally subnormal children. During this period there has in fact been a threefold increase in the places available, from 11,000 to 34,000. The building programme already announced for the period ending March 1963 will provide another 10,000 places but it is estimated that the rising school population will require something in the region of 54,000 places by 1965. The Minister stresses the value of early selection of retarded children, the majority of whom will be adequately managed in special classes in ordinary schools. The need for more teachers who are prepared to undertake this work after suitable training is obvious and the Minister expresses the belief that authorities will be able to make 'considerable progress in the next few years'.

ARMY VENEREOLOGY

IN 1897 the incidence of venereal disease among British troops in the United Kingdom was 127.5 per 1000. In 1960 it was only 5.8 per 1000. In recording these figures in an article on 'Milestones of Army Venereology', Colonel B. Levy (*J. Roy. Army med. Cps*, 1961, **107**, 152) comments: 'It is fitting that this achievement should be recorded as a tribute to the devoted work of many regular and temporary officers who acted as advisers and specialists in venereology'. Outstanding among these, of course, was Colonel L. W. Harrison. Colonel Levy, however, adds a note of caution: 'In certain overseas stations, particularly the Far East, the incidence of V.D. is still high and is likely to remain so, and it is by no means certain that the position at home will remain satisfactory'.

AMERICAN SURGERY

IN a twelve-month period in 1957-58, around 6.5 million operations were performed in hospitals in the United States of America, and about 4 out of every 100 Americans had such an operation. Whilst the majority of these operations were carried out by surgical specialists a joint survey by the Health Information Foundation and the National Opinion Research Center, University of Chicago, of 2,941 families showed that 22% of these operations were per-

Trouble brewing

When they fall ill, old people living alone and often inadequately nourished present the doctor with a patient physically unprepared to withstand surgery. Patients like these can be built up to a more robust state with the help of 'Anapolon', the new anabolic agent. 'Anapolon' restores the metabolic balance and stimulates appetite. It helps to strengthen debilitated patients and shortens convalescence.

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ENDURON is a distinctive analogue of the thiazide family, created by Abbott. Usual adult dose is only 2.5 to 10 mg. once daily; this low multigramme dosage provides the security of a very safe therapeutic ratio.

Bibliography: 1... Clinical-Pharmacologic Investigation of Methyclothiazide, a New Oral Diuretic; Comparative Clinical Effects of Hydrochlorothiazide and Methyclothiazide, *Current Therap. Res.*, 2:422, 430, September, 1960.

2... Clinical Studies of the Antihypertensive Effects of a New Benzothiadiazine Diuretic, *submitted for publication.*

ABBOTT LABORATORIES Ltd., QUEENBOROUGH, KENT

formed by general practitioners. Specialists accounted for 89% of the gastro-intestinal and genito-urinary operations, and 85% of the hernia operations. General practitioners, on the other hand, performed 34% of the 'T and A's', 32% of the 'D and C's', and 23% of the appendicectomies, and they accounted for 39% of all the surgical procedures in hospitals with less than 50 beds but only 5% of those in hospitals with 500 beds or more. Taking the whole range of those practising surgery, 88% were within the age range, 35 to 64 years, and only 4% were older than this.

PARROTS AND BUDGERIGARS

'BUDGERIGARS bred in Great Britain are not a common source of psittacosis infection of man', according to F. O. MacCallum and his colleagues of the Virus Reference Laboratory, Colindale (*Monthly Bull. Minist. Hlth Lab. Serv.*, 1961, **20,** 114). On the other hand, there is some risk of infection from recently imported parrots and parakeets, and attention is drawn to the possibility of introducing infection from such a source into a stock of budgerigars bred in this country. The hope is expressed that 'extension of breeding facilities of parrots and parakeets in this country will reduce this hazard'. Incidentally, it is stated that the estimated number of budgerigars in the country is now around four million.

TOBACCO STAINS

POTASSIUM permanganate is an effective agent for removing tobacco stains from the skin, according to S. Ansbacher (*J. Amer. med. Ass.*, 1961, **176,** 244). The instructions for use are as follows. 'Simply rub a few crystals on the stained skin, wash with warm water, follow up with a small amount of sodium bisulphate, rinse with warm water, and rinse with vinegar'.

BEAUTY CULTURE IN HOSPITAL

FIRST introduced in mental hospitals, 'beauty therapy' is now spreading, according to a statement issued by the British Red Cross Society. There are now 30 trained Red Cross members doing beauty therapy and hospital authorities are asking the Society for more. 'With increasing attention to the emotional aspects of care of mothers in childbirth', the statement says, beauty treatment 'has potentialities in maternity hospitals and indeed in connexion with antenatal care. And women in ordinary hospitals having undergone operations or other treatment often feel the need for the morale raising which professionally applied beauty therapy can give to a woman'. Incidentally, an interesting observation, which may prove of practical value to the harassed practitioner, is that 'beauty treatment of the finger-nails is an effective deterrent to nail-biters'.

PROCAINE (H_3) IN GERIATRICS

THE effect of procaine (H_3) has been studied by T. O'Connell and F. Ofner (*Med. J. Aust.*, 1961, **i,** 514) in 30 geriatric patients 'with symptoms which according to Aslen should have been relieved' with procaine treatment: i.e. symptoms produced by the triad of cerebral arteriosclerosis, arthropathies and circulatory disease. Treatment was continued for seven months. The results are summed up as follows. 'No beneficial effects were noted in the seriously ill patients. In mild cases some non-specific response was seen, without the basic organic pathological process being altered'.

ADOLESCENT PREGNANCY

IN an analysis of the records of 1,137 pregnant girls aged 16 years and under, who were confined in two Cleveland hospitals, R. Azar and A. E. Bennett (*Amer. J. Obstet. Gynec.*, 1961, **81,** 934) report that 90 per cent. were Negro patients and 10 per cent. white patients. Sixty per cent. of the Negro patients were unmarried, compared with 35 per cent. of the white patients. Just over 80 per cent. of them were pregnant for the first time; 20 (1.8 per cent.) were pregnant for the third time. Only 5.8 per cent. were seen during the first trimester of pregnancy, and 18.9 per cent. were not seen until admitted to hospital in labour. The average duration of labour was 12.1 hours. The incidence of toxæmia of pregnancy was 10 per cent., but only 17 of these 109 patients had severe pre-eclampsia or eclampsia. The incidence of premature infants was 18.7 per cent., compared with 14.7 per cent. for the hospitals as a whole.

PUBLICATIONS

The Extra Pharmacopœia (Martindale). *Supplement* 1961 is accurately described in the preface as 'an invaluable adjunct to the main volumes'. The spate of new preparations pouring forth from the pharmaceutical laboratories is such that it is wellnigh impossible for the practitioner or pharmacist to keep pace with it. Since the last edition of Volume I of 'Martindale' was published in 1958, for instance, some 200 new drugs and 800 proprietary medicines have been introduced in Great Britain. This *Supplement* will go far towards helping the unfortunate practitioner (and pharmacist) to keep his head above this flood. It is an essential job brilliantly done. (The Pharmaceutical Press, price 32*s.* 6*d.*)

The Psychological Care of the Child in Hospital, by Agatha Bowley, PH.D., F.B.PSY.S., is an excellent little book which underlines the recommendations of the Platt Committee's Report on

the welfare of children in hospital. (Unfortunately the introduction gives 1951 instead of 1959 as the date of publication of that report.) Dr. Bowley shows how the report should be implemented beginning with a wise chapter on how the child views hospital and from this she is able to build up the way in which a child can be prepared for the experience and how the parents can help and how they themselves react. Many hospitals still shelter behind the excuse of expense or accommodation to avoid allowing more visiting but, as a small section on reception indicates, there is a lot to be done by a complete change in the attitude of the nursing staff which should cost nothing! (E. & S. Livingstone Ltd., price 4*s*. 6*d*.)

Louis Pasteur, by Jacques Nicolle, is accurately described on the dust-cover as an 'expository account' of Pasteur's life and work. What the author has done is to pick out the main problems tackled by Pasteur. Thus his chapter headings are the tartaric acid problem, fermentation, spontaneous generation, the vinegar problem, the diseases of wine, silkworm diseases, research in brewing, anthrax, chicken cholera, and rabies. In each case the problem facing Pasteur is summarized and this is followed by an account of how it was tackled. It is exposition at its French best and will prove of interest to those already acquainted with Pasteur's life, as well as to those who have never read Vallery-Radot's biography. (Hutchinson & Co., price 35*s*.)

Cone of Oblivion, by L. J. Ludovici, is an interesting account of the famous 'ether controversy'. The author comes down heavily in favour of Morton as indeed most impartial reviewers of the subject have done. Even so, it is difficult to work up much sympathy for Morton. Mr. Ludovici excuses him on the grounds of 'other days, other customs', and the fact that he was a dentist with correspondingly lower standards of conduct than doctors in those days. Even making all allowances, however, and fully accepting that Jackson was the villain of the piece, the episode still leaves an unpleasant taste in one's mouth. (Max Parrish & Co. Ltd., price 25*s*.)

William Harvey: Englishman, by Kenneth J. Franklin, D.M., D.SC., F.R.C.P., F.R.S., is clearly a labour of love. It is more an exposition of Harvey's work than a biography. Written in rather a rambling, breathless manner—it is not even divided into chapters—it makes heavy going for the novice, but the Harveian devotee will find it pleasant reading. The more objective student of the history of medicine will occasionally wonder whether this is not an example of adulation carried just a little too far. (MacGibbon & Kee, price 18*s*.)

The Profession of Chiropody is a handbook which is intended to assist 'young people searching for a creative career such as chiropody is able to offer'. Produced by the Society of Chiropodists it will be distributed free to all medical and public bodies. (8 Wimpole Street, London, W.1.)

Donald Ferrier announce that the 1961-62 edition of their catalogue of nursing textbooks is now available free on request (8 Teviot Place, Edinburgh, 1).

OFFICIAL PUBLICATIONS

Report of the Ministry of Health for the year ended 31st December 1960. Part I The Health and Welfare Services.—For those who enjoy statistics part I of the Ministry of Health's annual report is a sheer joy. In 1960, for instance, 59,000 new patients were supplied with hearing-aids, bringing the total number since the inception of the Service to 735,000. There were 5,451,000 sight-tests, 89% of which resulted in prescriptions for glasses. The number of registered blind persons rose to 97,459, of whom more than 50% were over 70 years of age. The number of effective blood donors rose to 853,763, and the total number of donations exceeded a million. The ambulance services carried 16,764,189 persons and covered 106,021,572 miles, whilst chemists dispensed 218,685,118 prescriptions at a cost of £79,193,781.

All this was achieved at a cost of £726.5 million, an increase of 8.2% compared with the previous year. The comparable increase in the national income was approximately 3.4%. These are but a very small selection of the figures provided in a report which, in the words of the official hand-out, is 'amplified, with 90 pages of statistical appendices'. (H.M. Stationery Office, price 12*s*.)

Report of the Medical Research Council for the Year 1959-1960.—As always, the report contains a wealth of valuable material, and the ever-widening field covered by the Council's research projects is shown by the list of subjects which are reviewed. These range from 'The viruses of the common cold' and 'The causation of chronic bronchitis' to 'Energy expenditure in man' and 'Physiological research in epilepsy'. (H.M. Stationery Office, price 15*s*. 6*d*.)

Corrigendum.—In the article on page 216 of the August issue the approved name for 'lucofen' was given as 'chlorphentamine'. This should read 'chlorphentermine'. This preparation is now available as sugar-coated tablets and not enteric-coated tablets as stated on p. 218.

NOTES FROM THE CONTINENT

A European Newsletter

BELGIUM

Hyperthyroid madness.—At a meeting in April of the Belgian Royal Academy of Medicine, Professor P. de Moor, of the University of Brussels, gave an account of hyperthyroidism with particular reference to the occurrence of mental symptoms during the course of this disease. Whilst classical descriptions mention two outstanding varieties of hyperthyroid madness—the agitated confusional crisis and a chronic manic-depressive-like condition—attention is drawn to the fact that psychiatrists and endocrinologists are still in disagreement on the question of etiology. The latter appear to believe that psychotic symptoms, which are not to be found in the ordinary case of hyperthyroidism, constitute a 'pathological foundation' upon which the endocrine disorder is more likely to arise but not, perhaps, until a long interval of time has elapsed since the onset of mental ill health was first noticed. Psychiatrists, on the other hand, recognize that the psychopathology bears certain resemblances to conditions known to be brought about by 'multiple intoxications', but they are not able to speak with one voice because, unlike their colleagues, they seldom have an opportunity to make careful studies of patients in the early stages. Professor de Moor is in disagreement with the endocrinological explanation, chiefly because in many patients who develop neurotic or psychotic symptoms the course of hyperthyroidism appears to be milder and its beginning is harder to fix with certainty, the diagnosis often only being possible in retrospect. It is equally difficult to be sure that any endocrine disorder has been cured, on account of the fluctuating conditions brought about in the body by the response of adaptive mechanisms to an unstable environment. Furthermore, the picture is complicated by the fact that some or all of the symptoms of hyperthyroidism may be mimicked by unrelated disorders.

The treatment of ten patients with acute confusional insanity is described, in all of whom symptoms indistinguishable from severe hyperthyroidism were also present.

Ocular tension and anæsthesia.—Disturbances of intra-ocular tension are occasionally found during the course of general anæsthesia, according to J. Collet who regards stimulation of the sympathetic pathways as one of the chief underlying mechanisms by which the pressure is likely to be elevated unduly. Depression of the cerebral centres, vagal hyperactivity and consequent inhibition of sympathetic tone are, he considers, among the precipitating factors in intra-ocular hypotension. In addition to the anæsthetic agents themselves including, for example, intravenous barbiturates, cyclopropane, ether and halothane, the author mentions particularly the important influence that drugs commonly used for premedication may exert. Nor are the ganglion-blocking drugs and muscle relaxants omitted since some of them have powerful side-effects which have a direct bearing on the problems discussed. Different anæsthetic combinations are compared statistically and Collet concludes that halothane, on account of its mild and sustained tendency to reduce the tension within the eyeball, is the anæsthetic of choice for intra-ocular operations. Stressing the importance of general anæsthetic skill, gentle induction and intubation, the author mentions some of the special problems encountered in surgical operations on the eye in childhood.

Chemotherapy of cancer.—Recent advances in this subject were described by Professor Desaive at a meeting of the Belgian Royal Academy of Medicine. Of the various cytotoxic agents used, nitrogen mustard is foremost, and the intra-arterial route is considered the most effective. Preliminary angiography of the region involved often yields valuable information; especially as the more vascular a growth the more effective will this kind of treatment be. In some cases the action of the drug may be enhanced by slowing the return blood flow from the tumour area. Much larger doses than could ordinarily be tolerated may be given to certain patients with peripheral growths of limbs by establishing an artificial circulation to the part to be treated. By this method, for example, Professor Desaive has been able to administer as much as 100 mg. of nitrogen mustard in ten equal doses over a period of a few hours only. Details of several cases were given from which it appeared that recurrent growths of proved malignancy had been destroyed.

It is clearly too soon to form any definite conclusions about this interesting work, but Professor Desaive stressed that much remains to be done before the value of any particular technique can be regarded as firmly established.

GERMANY

Abdominal auscultation. — Simple diagnostic techniques are apt to be overlooked in an age when special investigations are so often employed, according to E. Kelemen who regards auscultation of the abdomen as having a valuable contribution to make in the diagnosis of acute abdominal emergencies. Indeed there are occasions when more information can be gathered from this method than from palpation, especially in the three or four days immediately following a laparotomy. Emphasizing that, as with most other diagnostic endeavours, a certain amount of practice is necessary, the author recommends the wider use of this technique and mentions that it must be unhurried and gentle. The best place for auscultation is stated to be about 2 cm. below and to the right of the umbilicus and three to five minutes are 'nearly always essential' before the examination can be regarded as complete. Auscultatory findings are particularly valuable after abdominal operations especially as their correct interpretation may reveal the onset of some complication sooner than could be done by any other method of examination. In the first two or three post-operative days bowel sounds are either completely absent or very scanty but, in the absence of complications, normal peristalsis should be heard again on the third day. If the bowel remains silent as long as four days it becomes 'essential to search for a localized complication, mostly peritonitis'. If bowel sounds which have returned are later found to have disappeared again the possibility of ileus developing must be considered.

Cardiac massage in the newborn.—Although cardiac massage has been chiefly regarded as a life-saving measure in adults during anæsthetic emergencies, H. Epple and J. M. Sutherland suggest that it may have a valuable part to play in the treatment of neonatal asphyxia. Their own experience and the reported cases support the view, they maintain, that in addition to the usual resuscitative measures such as intubation and administration of oxygen, skin massage, and analeptics, cardiac massage is indicated when the heart has stopped beating in consequence of acute anoxia. Referring to the newborn's 'increased tolerance of anoxia' the authors point out that, in contrast to the adult, there is a chance of full recovery even after cessation of the heartbeat 'for several minutes'.

Poisoning.—The drugs that should have a place in every general practitioner's bag, and the urgent measures he should adopt to combat the effects of acute poisoning have recently been reviewed by S. Moeschlin. Apomorphine, as an emetic, should always be carried, most usefully as ampoules of 0.01 g. for injection; analeptics, cardiac stimulants together with powdered charcoal, magnesium hydroxide ('for the neutralization of acids'), kaolin (as an absorbent for alkaloids), purgatives, paraffin oil ('a good antidote to fat-soluble poisons'), chlorpromazine and noradrenaline, all these should find a place in standard equipment. Calcium and lævulose ampoules are also recommended, to say nothing of 'lævosan' and 'lævocholin' to help spare the liver from damage by hepatic toxins. Megimide has an essential place in the treatment of the all too common barbiturate poisoning, whilst intravenous hydrocortisone is mentioned for its usefulness in relieving the profound shock that is often a feature of serious overdosage of many poisons. Atropine, as an antidote to certain pest controllants (particularly E605), should also be included, and, finally, a 'stomach tube and funnel complete the equipment'.

The 'weaker' sex.—Almost everywhere in the civilized world it has been shown that women live longer than men; a finding that applies to a number of animal species as well, and which has excited interest and curiosity for many years. Examining some of the biological and sociological implications of this observation, W. Schweisheimer refers to an investigation carried out in America in which a study was made of Roman Catholic nuns and monks living in closed orders. The two groups were similar in a number of ways; their general mode of life was almost identical, whilst the strains and vexations inseparable from living anywhere fell upon them about equally. Yet it was shown that the nuns lived 'significantly longer' than the monks, in fact by 7 to 10% longer, a difference which coincides with that to be found in the population generally. Concluding that the reasons for the longer life span of women are 'of a biological nature' and have nothing to do with the mode of life, the author regards 'powers of resistance' and the 'constitutional vitality of the female sex' as the chief factors.

'Notes from the Continent' are produced in collaboration with the Editors of *Bruxelles-Médical* (Belgium), *Le Concours Médical* (France), *Münchener Medizinische Wochenschrift* (Germany), and *Minerva Medica* (Italy).

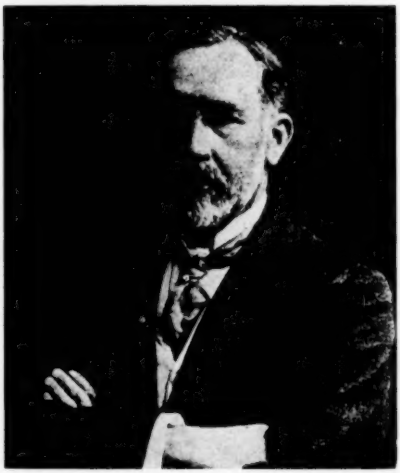
THE PRACTITIONER

Fifty Years Ago

SEPTEMBER 1911

'Dangers by being despised grow great'.—
Edmund Burke: *Speech on the Petition of the Unitarians.*

'WHEN we speak of appendicitis', writes Arthur E. Barker, F.R.C.S., Surgeon to University College Hospital, and Consulting Surgeon to the Queen Alexandra Military Hospital, Millbank, S.W., 'we are apt to associate the term solely with the idea of a local or general peritonitis and to ignore other effects of this dangerous



Arthur Edward James Barker, F.R.C.S.
(1850-1916)

disease'. In his clinical lecture on 'Lymphatic infection from appendicitis without peritonitis' he points out that infection may spread along the lymphatics, and though at operation the appendix 'may appear little or not at all affected . . . there may be lurking behind the apparently healthy peritoneum a considerable abscess, or cellulitis, giving no evidence of its presence through the smooth serous covering'. After discussing some case reports he concludes: 'My object in relating these cases has been to draw attention to the possibilities of lymphatic infection from the vermiform appendix, in cases where the peritoneal cavity escapes'.

Arthur Edward James Barker was educated in his native Dublin, and became a Licentiate of the Royal College of Surgeons in Ireland in 1870, proceeding to the Fellowship in 1876. He became a Licentiate of the Royal College of Physicians of Ireland in 1875, and in the same year joined the staff of University College Hospital, London, where he was appointed Surgeon in 1885. He became Fellow of the Royal College of Surgeons of England, *ad eundem* in 1880. Barker was consulting surgeon to the Queen Alexandra Military Hospital, Millbank, and the Osborne Convalescent Home for Officers. In 1893 he became Professor of the Principles and Practice of Surgery and Clinical Surgery at the Medical School at University College. Examiner in surgery at the University of London and at Victoria University, he was also Hunterian Professor in Surgery and Pathology at the Royal College of Surgeons of England. He delivered the address in surgery when the British Medical Association met in Belfast in 1909.

Barker was interested in leukoplakia of the tongue, and well known for his abdominal operations: he performed the first successful gastroenterostomy for malignant disease of the pylorus in this country. His brain operations included successful removal of a bullet from the upper surface of the corpus callosum. An advocate of spinal anæsthesia, he would himself administer the anæsthetic, and his results were excellent. A cool, resourceful, and deft operator, he introduced the 'surgical sewing machine' for use in abdominal and other operations. He preferred linen thread for sutures. A man of fine physique, no amount of work seemed to tire him. Visits to Continental clinics and a good knowledge of French and German enabled him to keep abreast with all important advances. He retired from the active staff at University College Hospital in 1915 at the age of 65, but was commissioned during the 1914-18 War. He died on active service in Salonika in 1916 from acute pneumonia and nephritis.

A. G. Miller, M.D., F.R.C.S., Consulting Surgeon to the Edinburgh Royal Infirmary, writing on 'Residual urine in old men', quotes a medical friend who told him that Sir James Paget 'used to urge elderly men to educate their bladders and not allow them to dictate to their masters'. His advice to those having residual urine is: 'After passing water in the usual way, wait a minute or two and then try again. Practise this as frequently as possible, till only a very small quantity can be squeezed out (say, half an ounce). When this point has been reached, twice or thrice daily may suffice'. After citing the

testimony of practitioners who have found this method effective in elderly patients, he gives his personal experience: 'Instead of having to get up two or three times during the night, I am now able, at the age of 68, to sleep for seven or eight hours without a break'.

'In my opinion', writes Douglas Drew, B.S., F.R.C.S., Senior Surgeon to the Queen's Hospital for Children, and to the Inpatients at the Hospital for Women, Soho, in 'Hernia in children, with special reference to the variations of the sac and the contents', 'a healthy boy should not be allowed to grow up wearing a truss; it hampers the freedom of his movements, and, what is even more important, it makes him conscious that he is not as other boys, and if the truss is persisted in for a long period it weakens the abdominal wall . . . all herniæ in children should be operated on at an early age'.

In 'The choice of the patient for artificial pneumothorax in the treatment of chronic pulmonary tuberculosis', S. Vere Pearson, M.B., M.R.C.P., Resident Physician of the Mundesley Sanatorium, Norfolk, and a pioneer in the use of artificial pneumothorax in Britain, bases his views on his experience with four cases. He describes the method as 'heroic and but comparatively rarely applicable'. In his opinion 'it must not be lightly taken, and it must be confined to those patients for whom ordinary treatment has failed, or is likely to fail. Early cases, therefore, are not eligible. It is to be used for patients whose disease is of grave severity'. Further, 'the patients must be in the position to continue under the treatment for as long as seems likely to prove necessary. Probably in most cases this means eighteen months at least, though occasionally the expediency of maintaining it for a distinctly shorter period may have to be considered under special circumstances'.

A. D. Edwards, M.B., B.S., D.P.H., Medical Officer of Health, Bournemouth, in 'An old medical journal' reports some gleanings from the *London Medical Repository* for 1815, one of the more interesting of these is as follows. 'In view of the occurrence in more recent times of cases of mental breakdown due to religious revivals, it is not surprising to find in the *Repository* a case of Demonomania, due to the preaching of "a set of priests called missionaries". One of the sermons had for its subject "Hell", and to heighten the effect of the frightful picture the preacher took a skull in his hand, and having raised a doubt regarding the soul to which it belonged . . . he cast it from him with such violence that from that moment a morbid change took place in the system of the lady who is the subject of this relation". The return to sanity of this poor demented soul was attributed to several peals of thunder, one of which was so particularly loud that "she was agitated and frightened and recommended herself to God" '. T. H. B.

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